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—THE—

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ARCHITECTS, CIVIL AND SANITARY ENGINEERS, PLUMBERS, DECORATORS, BUILDERS, CONTRACTORS, MANUFACTURERS OF AND DEALERS IN BUILDING MATERIALS AND APPLIANCES.

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Inspection of Elevators.

A COMMITTEE of the City Council of Toronto has under consideration the subject of the inspection of elevators by the municipality. Considering the number of accidents which have occurred, there appears to be need for such inspection. The number of elevators in use in the city is placed at 1,000 and the number of persons using them at 40,000. Presuming this estimate to be approximately correct, it will be seen how great is the liability of accident if the mechanism of these elevators, and the competency of the persons who may be placed in charge of their operation, is not placed under proper supervision and control.

Soldiers' Memorials.

Fitting public recognition has been made of the services rendered to Canada and the Empire by the members of the first Canadian contingent who recently returned from South Africa. Without doubt a hearty welcome home also awaits the members of the second contingent on their return. But what of the brave lads who laid down their lives in defence of the flag? It is not too early to consider what steps should be taken to express in the form of permanent and suitable memorials the nation's undying appreciation of their valor. While public enthusiasm is aroused as never before in our history, this matter should receive attention. In addition to a National memorial at Ottawa, there should also be memorials erected in the principal cities of the various provinces of the Dominion. Toronto probably could not do better than erect a permanent memorial arch on the site of the temporary one at the entrance to Queens Avenue through which the soldiers passed on their return to the

city. Such a memorial would form a fitting contrast in character to those already placed in Queen's Park to commemorate the death of the volunteers who fell in action at Ridgeway and in the Northwest Rebellion. It would also add interest and dignity to the approach to the Park and Legislative Buildings. The designs for the memorials should be obtained by competition, limited or otherwise, as might be considered conducive to the best result.

German Cement Combine.

FOLLOWING the example of their British confreres, the German manufacturers of Portland cement propose to organize a combine to restrict the output to the average quantity sold during the past three years with a fixed allowance for improvements and for new factories. The present output of the German factories is about six and a half million tons, while the consumption amounts to only four millions. New factories are also being built, with a capacity of two and a half millions. The British, Canadian and American manufacturers are thus likely to be saved from the price-cutting competition which must have resulted from the efforts of the German manufacturers to dispose of their large surplus production in the foreign markets.

Students' Competitions.

ATTENTION is called to students' competitions, particulars of which are printed in this number. The busy season is about to close. The long winter evenings are almost here. The students' opportunity for study and self-improvement is at hand. The student who is alive to his future interests will make profitable use of his time and opportunities this season. It is by placing one's effort's alongside those of others, that one is able to judge of his knowledge, abilities and progress. Every architect should feel an interest in his students. One way of manifesting that interest would be to call their attention to these competitions and encourage them to enter. Will every Canadian architect who may read these lines lend his co-operation in this direction? If so the success of the competitions will be assured.

The Teaching of Drawing.

AMONG the international congresses held in Paris during the last summer was one on "The Teaching of Drawing," which opened on August 29th and closed on September 1st. As the result of a full discussion of the subject, first in separate sections and afterwards in full assembly, the following conclusions were reached. (1.) That drawing should be made a compulsory subject in general education. (2.) That the initiative of the teacher and the individuality of the student should be encouraged to the fullest degree possible. (3.) That the artist and workman should be brought into closer contact by the former devoting greater attention to the requirements of the trade for which he designs and by providing for the latter a more liberal art education. (4.) That the architect requires a more scientific training and the engineer a more artistic training in order that the two professions may work in closer contact with each other.

Opportunities for Trade Expansion.

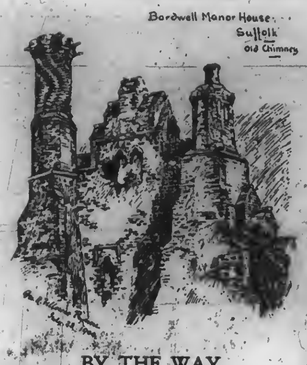
THE return of the Canadian contingent from South Africa reminds us that the war is now drawing to a close and although it may be some time before it is entirely over, trade there is just beginning to resume its former shape. There is little doubt that as soon as security to those commercially engaged can be depended upon, a very considerable expansion in trade may be expected. Tariff rates in the two states which have recently been annexed to the British Empire were formerly almost prohibitive, so that when this new field can be added commercially to that already known in Cape Colony and Natal, the market should be one worth enquiring into. Another change in the Empire is to be made on January 1st., when the Australian colonies are to be federated into one Commonwealth which will necessitate a revision of tariff rates as each colony had its own tariff. It would therefore probably be a suitable time for persons interested in the expansion of trade to enquire into the chances to be found in this field for Canadian products.

Shingles.

IT has been interesting to watch the struggle for popular favor between the different varieties of shingles. Our observations lead to the conclusion that the white pine shingle is losing ground, and that its field is gradually becoming more limited. In the western part of Canada, for instance, preference is given to the red cedar shingles, while in eastern Canada the white cedar shingle is largely used. In Ontario the white pine shingle may be said to still hold the market, but even in this province it is meeting with severe competition from other varieties. One of the reasons for this encroachment on the white pine field is the comparatively lower price of cedar shingles. Another reason which has been advanced is that the quality of the white pine shingle is deteriorating, and that even the clear butts sometimes have worm holes in them. It is unlikely that the manufacturers of white pine shingles will endeavor to materially improve the quality of their production, as the high price of pine stumpage makes it necessary to convert into shingles only that portion of the logs which will not make merchantable lumber. It is a significant fact also that the red cedar shingle as now manufactured is a much better article than that which was submitted to the eastern trade a few years ago.

Storage of Explosives.

THE disastrous explosion which recently occurred in a wholesale drug warehouse in New York, has called attention to a source of danger which appears to have been to a large extent overlooked. True, the building regulations of most of our cities contain a regulation prohibiting the storage of any considerable quantity of explosives within specified districts. Such a regulation appears to have existed in New York, but its enforcement was not properly looked after, and the present disaster to life and property is the result. This occurrence should lead to an investigation by the municipal authorities of Canadian cities, to learn if the provisions of the building by-laws in this particular are being observed. The liability of insurance companies for damage arising from explosions of this character also enters into the question. We observe that the standard insurance policy in New York provides that the insurance companies shall not be liable for loss caused by explosions of any kind, unless fire ensues, and in that event for the damage by fire only. The plate glass insurance companies have refused to assume liability for damage to windows within the area damaged by the explosion. It will thus be seen how important are the interests hinging upon the proper enforcement of regulations for the prevention of storage of explosives within the central districts of towns and cities.



BY THE WAY.

THE Assessment Department of Toronto estimates that there are now in that city only 630 vacant houses, and 131 vacant stores, as compared with 3,311 vacant dwellings, and 648 vacant stores in 1896, and that to meet the requirements of population 1,200 houses must be built next year.

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THE multiplicity of strikes and their far reaching effects upon the welfare of the persons immediately concerned as well as upon the industrial progress of the Dominion, necessitates the adoption of legislation which would be effective in putting a stop to this method of settling disputes between capital and labor and such scenes as were recently witnessed at Valleyfield. Compulsory arbitration on similar lines to the New Zealand law seems to be the best solution of the question.

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I AM pleased to note that the teaching quality at the Toronto Technical School is being improved. Mr. Barrett, a capable young architect, was recently appointed instructor in Building Construction. Mr. Banks, whose skill as a modeller is well known in Toronto, has been engaged to give instruction in modelling. If the services of equally well qualified teachers can be procured for the other departments the school may be expected to do much better work in the future than in the past.

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THE authorities of Queen's University, Kingston, have issued an invitation to architects to submit plans and designs for new buildings to cost about $150,000. It contains the usual clause that the said authorities do not bind themselves to accept any of the plans submitted. No provision is made for the appointment of an expert to judge the plans. The matter has been brought to the attention of the Ontario Association of Architects who will try to enlighten the authorities regarding the conditions which should govern competitions of this kind. No self-respecting architect should have anything to do with the competition in its present form.

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THIRTY TWO granite columns each 54 feet long, by 6 feet in diameter, and weighing about 160 tons, are to form a feature of the construction of the cathedral of St. John the Divine, New York city. The rough blocks of granite from which these columns are made, each measure 67 feet long, 8½ and 7 feet cross section, and weigh 310 tons. The corners are roughly dressed off by hand, after which the block is placed in a lathe 86 feet in length, having a swing of 6 feet 6 inches by 60 long, fitted with eight cutting tools, each of which takes a cut 3 inches in depth. These cutters reduce the diameter of the block by 24 inches at one passage over its surface. Six weeks are required to dress and polish each column.

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THE Builders' Journal refers to the foolish custom still prevailing at Freiburg, in Germany, of offering a reward of five shillings and a good dinner to the steeple jack who will climb to the top of the tower of the Minster, a height of 400 feet. This performance forms a feature of the celebration of the birthday of the reigning Grand Duke of Baden. In the ascent the men have to leap from stone to stone, and as the space between these is considerable in some cases, it will be seen what an idiotic practice this is; one miss and the man would be dashed to the ground. When the top is reached a pistol is fired and then the descent is made. Three men went up the tower the other day, and one of them performed acrobatic feats on an iron bar fixed about half-way up.

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THOSE who have studied the methods of the trades unions have noticed that the chief object sought to be attained by them is to secure for their members the highest possible renumeration for the least amount of skill and labor. The working hours have been reduced from ten to nine; again in many cases from nine to eight. This rate of progress is too slow however, for some of the more advanced thinkers on this subject, in which class deserves to rank the Rev. S. S. Craig, a representative of what is called the People's Party. This gentleman in an election address delivered in Toronto, is reported to have said: "He was glad to see the eight hour working plank. But he wanted something more; he wanted a four hour working day and the taxation of land values would produce a four hour working day. Then our wives and our daughters would not have to leave their homes to work for a living, and everbody would have full opportunity for work." Isn't it the opportunity to escape work that is being sought for?

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A GENTLEMAN who has recently visited Sydney, C. B., has been telling me of the wonderful development which has taken place in that town since it became known that the Dominion Steel Company had decided to establish extensive works there. Property which before was considered to be of little value, has enormously advanced in price; indeed it is stated that owners do not apparently know how much to demand, and the prices asked are in many instances ridiculously high. The Bank of Montreal is said to have paid $8,000 for a site sufficient for a new building on one of the principal corners. The number of stores and high class stocks therein is said to be entirely out of proportion to the requirements, as the majority of the new population which has been brought into the town, in consequence of the operation of the steel company, principally consists of the laboring class, whose wages are small and who therefore can purchase only the cheaper class of goods. After a time, when the works are constructed and put in operation, a larger proportion of skilled workmen will be employed at higher wages, but even then it is considered doubtful if many of the new establishments which have been started will find it possible to do a profitable trade.

The Keizer Brick Machine & Mfg. Company, of Winnipeg, are applying for incorporation.

ARCH OF TRIUMPH, PARIS.

CANADIAN SOLDIERS' MEMORIALS.

By request a number of gentlemen prominent in artistic, military and business circles have kindly sent us a brief expression of their views in regard to the desirability of immediate action being taken to erect suitable memorials to the memory of the Canadian soldiers who fell in defence of the Empire in South Africa. These opinions are appended as follows:

GENTLEMEN,—I have your valued favor of Nov. 8th and have read the accompanying proof of the proposed article in relation to a Memorial of the participation of Toronto in the South African War, and in reply have to say that I think it is desirable that while the public is alive to the question, some means of recognition should be adopted. Your article doubtless will provoke discussion, and enable those interested to form a better opinion than could be done off hand without greater consideration than I have been able to give to the question.

It has occurred to me that the men who sacrificed their lives in this War, should especially have recognition, and whether the Arch is erected or not, the portraits of these men who went from Ontario, should be placed in the Parliament Buildings.

I know that in some cities of the United States, the representatives who perished in the War of the Rebellion, have been honored in the way which I have indicated—thus, in Harvard College there is a Memorial Hall devoted entirely to this purpose.

Yours very truly,
EDWARD GURNEY.

SIR,—Replying to yours of yesterday's date, I quite approve of the "Soldiers' Memorial" exactly on the lines that you suggest. I think it is the duty of the citizens of Toronto to in some satisfactory manner permanently commemorate the men who went to South Africa, and I think no better form could this memorial take than a permanent archway where the temporary one was erected at the end of Queen Street Avenue. Appreciating the honor you do me in asking my opinion, believe me,

Yours truly,
JOHN I. DAVIDSON.

Toronto Nov. 10, 1900.

DEAR SIR,—I was very pleased to receive a few minutes ago, your circular letter respecting a permanent arch to be erected in Toronto as a fitting recognition of the services that Canada's sons have rendered to the Empire. I would suggest; however, that a better and safer location than the one you mention would be at the College street end of the avenue. Queen street being such a thoroughfare, I fear the same difficulty in preserving it would occur as what happened to the fence around Osgoode Hall, where every corner of the stone pilars was broken off by hoodlums loitering around in that vicinity. I think the arch should be of substantial stonework, and as it would be at the very entrance of Queen's Park, that a statue of Her Most Gracious Majesty, the Queen, should adorn the top of the arch. I am quite sure if the ladies of Toronto would take this matter up, they would carry it through to a successful issue, as they have never yet failed in any undertaking of a loyal and patriotic nature. Wishing you every success and assuring you of any assistance I can possibly afford,

Yours faithfully,
J. M. DELAMERE,
Lieut.-Col. Com. Q.O.R. of Canada.

GENTLEMEN,—Replying to your letter of the 8th inst., enclosing copy of article referring to a suitable memorial for our Canadian boys who have died for the Flag in Africa, I would say that I am in sympathy with the idea, and think that some recognition should be made in the shape of a memorial in the Queen's Park. They certainly have done their duty well and faithfully, and we are under a deep debt of gratitude to them.

Yours faithfully,
A. E. KEMP.

DEAR SIR,—I am heartily in accord with the proposition to erect a memorial to those Canadians who gave their lives for the cause of freedom in South Africa, and as a Canadian artist I am jealous that the memorial shall be a fitting tribute in its aspect as a work of art. I approve of obtaining designs through competition, but only on condition that a competent jury is appointed to decide on the merits of the designs. The Toronto Guild of Civic Art is organized for the purpose of arranging such matters, both as to how designs should be submitted and the appointment of fit persons to pass judgment upon them, and I hope the arrangement of the purely artistic portion of the work will be entrusted to that body. I would suggest, as a practical step to take, that the Guild be asked to look into the matter, and prepare several alternative schemes with the approximate cost of each. Speaking as a member of the Guild, I believe immediate action on their part would result from such an invitation from the Red Cross Society, who have initiated the idea.

Sincerely yours,
G. A. REID.

INDIAN ROAD, TORONTO, NOV. 13TH, 1900.

DEAR SIR,—I wish to assure you of my sympathy with your proposal to erect a memorial to members of the Canadian Contingent who fell in South Africa. Some memorial should be erected and it is time now to make suggestions. But as regards the especial memorial you propose—an arch over Queen's avenue—I hesitate to express unqualified agreement. If it were intended to raise a memorial to troops returned from victory, such an arch as they might march under on the day of their return would be a suitable memorial; the present custom for temporary decorations and precedent for permanent structures suggests it. But as an erection in honor of the dead, it seems, whether innately or from custom, inappropriate.

I offer this criticism of the particular proposal made, but hope, and indeed cannot doubt, that the general idea will meet with approval from everybody.

Yours truly,
W. A. LANGTON.

94 KING ST. WEST, TORONTO, Nov. 12th, 1900.

DEAR SIR,—I think the proposal to erect a permanent memorial to our Canadian Soldiers on the site of the temporary triumphal arch is a very good one.

But I hope if this work is undertaken at all it will be done as well as they did their's.

An important opportunity like this of permanently recording a great event in our country's history should be thought out as well as we are able, so that there will be no risk of belittling either the deeds of our soldiers, or a site so valuable with a mean erection.

The Guild of Civic Art was formed I believe to advise upon these matters and I hope they will see that the project is dealt with in a large enough manner, and not leave us with a monument like something adrift from a graveyard.

Yours truly,
EDEN SMITH.

CANADA LIFE BUILDING TORONTO, Nov. 13th.

DEAR SIR,—I have read your suggestion that an arch should be erected at the foot of Queen's Avenue to commemorate the bravery of the Canadian troops in South Africa. I heartily approve of the suggestion. The co-operation of the colonies with the mother land marks clearly an epoch in our history, and no more appropriate form of monument could be erected than an arch. The position is an admirable one, and I think the Ontario government should unite with the city in erecting an arch that would reflect credit on our country and city.

Yours truly,
JAMES L. HUGHES.

TORONTO, Nov. 13th, 1900.

GENTLEMEN,—I duly received your favor enclosing a circular with reference to the proposed memorial to those of our volunteers who were killed and wounded in South Africa.

I agree with your idea that a permanent memorial arch should be erected on the site of the temporary one at the entrance to Queen's avenue, and shall be pleased to subscribe to a fund for that purpose, providing the matter is dealt with promptly.

Yours truly,
J. O. THORN,
Honorary Captain, Quarter-Master, 2nd Regiment Queens' Own Rifles of Canada.

TORONTO, ONT. Nov. 14, 1900.

DEAR SIR,—Our society having heard from Mr. Reid, our President, of the intention to erect an arch to commemorate the death of our soldiers who fell in South Africa, heartily endorse the suggestion, and would advise that all our architects and artists be invited to send designs, and that judges appointed by the Guild of Civic Art select the most artistic and suitable for the purpose.

Yours truly,
ROBT. F. GAGEN,
Secretary Ontario Society of Artists.

TORONTO, Nov. 14, 1900.

DEAR SIR,—Relative to your suggestion regarding a memorial to be erected in honor of the brave Sons of Canada who have laid down their lives in defence of the Empire in South Africa, I think there cannot possibly be two opinions upon the advisability of erecting some permanent and suitable monument in recognition of their services.

What is done, however, should be done well. The monuments now existing in Queen's Park commemorating the death of those who fell at Ridgeway and in the North West Rebellion, are not, in my opinion, worthy of the deeds which they commemorate. Any monument which may be erected to the memory of those who fell in South Africa should be one in which we can always take a pride in pointing to. I think the suggestion of an arch, at the entrance to Queen's avenue is a good one, and it would add, as you say, interest and dignity to the approach to the Park, as well as commemorate in a most fitting manner the services of the Canadians who fell in South Africa.

Yours truly,
W. C. MACDONALD, Lieut.-Col. 48th Highlanders.

TORONTO, Nov. 14, 1900.

Honor the brave! Who desires to do otherwise? But in taking steps to perpetuate the deeds and memory of Canada's brave sons, let us not be carried away by sentiment, as the stern, stubborn facts of ways and means will confront us sooner or later.

All honor to the Red Cross ladies who are desirous of erecting a memorial arch in College avenue, as to which, the suitability and site, there would likely be little contention if we were assured that the amount required would be forthcoming, and the result be satisfactory. Let us not attempt too much for fear we fail. Past experiences should make us cautious. How much are we prepared to expend and what we are likely to accomplish, should be our first consideration. If we find a memorial arch is out of the question why should not the City Hall be the receptacle of a bronze Commemoration Panel, or one in relief, or of a piece of statuary. In mentioning the City Hall as a suitable place, might we not look forward to this building becoming the treasure house of such mementos as we may erect from time to time, either in marble, stone or bronze, a building visited by thousands of tourists annually, and a building so well adapted for the purpose.

There is no doubt that if anything is to be done now is the time, and why, I might ask, should this not be a Provincial monument? The position of Toronto is central, and the site most desirable, whether in or out of doors. Toronto, no doubt, will contribute most of the funds, but other sections of the Province should not be debarred from contributing their quota to a monument in which they are as much interested as ourselves.

R. Y. ELLIS.

TORONTO, Nov. 1, 1900.

"From the earliest times to the present day the deeds of kings and heroes have been recorded in arches of stone. The Propylea at Athens, the arch of Constantine at Rome, the arch of Triumph at Paris, the Washington arch in New York, and the marble arch in London are familiar examples of this fact. These memorials have been the means of perpetuating the memory of men and events which would otherwise have passed into oblivion. Such commemoration, recording the gratitude and appreciation of the nation, incites to great deeds and emulation in those living and in generations yet unborn. These memorials fix in the mind the sacrifices of a people on the altar of patriotism as nothing else can. They become objects of patriotic pilgrimage, and from them emanate influences which contribute to the fostering of national ideals which make for the upbuilding of the nation.

Canada has taken her place among the nations of the earth, and has demonstrated that she is an integral part of the British Empire. Shall we not record the deeds and the daring of her gallant sons? Shall we allow the names and the sacrifices of our fallen comrades to be forgotten? They have not died in vain, for their blood has cemented the structure of the British Empire.

The city of Toronto, as becomes the capital of the great province of Ontario, is adorned with statues and memorials of Ontario's illustrious dead. Shall we not rise equal to the importance of the occasion and erect a Provincial Arch of Triumph to her victorious sons, and to record for all time the names of the gallant dead who fell in the defence of the Empire and in the sacred cause of civil and religious liberty in South Africa.

I propose the formation of a committee to be composed of representatives of the Red Cross Society, National societies, the military element and representative men in Ontario to take the matter up and bring it to a successful issue.

G. STERLING RYERSON.

DEAR SIR,—In reply to your article re Soldiers' Memorial, I agree that some steps should be taken to express our gratitude for the sacrifice those brave boys made in giving up their lives for our country, and no more fitting monument could be erected to their memory than a permanent arch at the entrance to Queen's Park avenue.

I would therefore suggest, if this idea finds favor, and it surely must, that the architects and artists of Toronto be requested to

submit designs (with specifications as to cost). These designs to be placed on exhibition and competent judges apppointed—judges above approach and reproach—to select the best and most suitable one. Then a fund might be started by the citizens to defray expenses.

Yours truly,
McGILLIVRAY KNOWLES, R.C.A.

DEAR SIR,—I regret that owing to press of business I have been unable to answer earlier your letter of 8th inst. I sincerely hope that an enduring monument of some character in honor of the work of the Canadian Contingent in South Africa will be erected, but I should regret if it took the form of an arch unless a large sum of money, somewhere between $25 and $50,000 could be raised, which I think is out of the question. In any event I do not think that an arch at the entrance to the avenue in question would be desirable. A bronze statue in the uniform worn by the Canadian Soldiers in South Africa would, in my opinion, be much more readily accomplished in view of its cost.

Yours truly,
B. E. WALKER.

TORONTO, November 17th, 1900.

Dear Sir,—I am much obliged for your letter of the 8th, instant with accompanying proof of the article which is to appear in the November number of the "Canadian Architect and Builder." I am quite in accord with the suggestion made therein and am glad to observe that a movement is already on foot in Halifax for the perpetuation of the memory of our soldiers who fell in South Africa, by some fitting memorial.

Yours very truly,
F. W. BORDEN.

Ottawa, 19th November, 1900.

ARCHITECTS' AND ENGINEERS' NEW ROOMS.

The Ontario Association of Architects from date of 15th Nov., are going to have a local habitation, in pursuance of plans laid before and endorsed by the last convention. The second floor of Nos. 94 and 96 King street west have been rebuilt by Messrs. Darling & Pearson, and adapted to the requirements of architects' and engineers' association rooms—to be used for the furtherance of the interest they have at heart—the personal intercourse, interchange of ideas, and criticism of methods, which makes for that atmosphere in relation to these matters which mark the larger centres, which broadens and refines as opposed to narrowing isolation.

The entrance from the street is not all that was promised. Existing leases prevented the carrying out of the terra cotta front for the present, but passing through a massive oak door and ascending an oak stairway, at the landing is entered the lobby, or ante room, common to both engineers and architects. This is an effective square hall, twenty feet wide with unique prismatic ceiling light. The woodwork, including impost of large cove to ceiling, is all white, excepting a tint on the cove, a strikingly effective wall paper in green and blue, yellow, and red mahogany doors, with old brass furniture. From this ante room (which is to be furnished as a comfortable common meeting ground or 20x40 feet; architects' room, 20x20 feet; Engineers' room, 20x19, all members) are five doors, giving access to assembly room, a lavatory filled up in marble; a cloak room with sink and gas range, and large enough on occasions for serving luncheon or dinners. The assembly room will seat 125, is finished in white enamel, except high dado of sheeting covered with crimson burlap for tacking up drawings on exhibition. A raised dais and blackboard marks the speakers' end. The ceiling is a segment of a circle supported by heavy cambered beams.

The architects' special room has three windows looking on to King street; it has a great mantel, a book case with leaded glass doors, a fixed seat and desk, shelf and picture mould carried entirely around the room, giving continuity to the whole effect. The finish of woodwork is an antique green stain, harmonizing with reddish brown wall paper of bold pattern. Massive oak table and chairs, chosen for comfort most of all, black iron dogs set in brown tile hearth, with Turkish rug on the floor and warm curtains on the windows, completes the furnishing of the room.

The lighting of the entire floor is by electricity and is made very effective, especially in common lobby with its eight ceiling drops.

The members are earnestly urged to make use of the rooms on all possible occasions. The furnishings are not yet complete, but it is the intention that their homelike character will make the rooms a congenial place of meeting—to have on their tables and shelves such periodicals and books as will illustrate the world's architecture and art, and keep the members in touch with it.

Branch Office of the CANADIAN ARCHITECT AND BUILDER,
Imperial Building.

MONTREAL, November 16th, 1900.

CANADIAN SLATE.

Since 1893 the production of slate in Canada has gradually been decreasing, and one by one the different quarries have closed down until now there is not a slate turned out in the whole Dominion. This regrettable state of affairs was brought to a climax last May when the quarries of the "New Rockland Slate Co." were shut down. Their quarries have been the only ones working for the past two years, and as the slate turned out has almost invariably been of a uniform good quality, it is with regret that we draw the attention of our readers to the fact, and trust that soon we may hear of their starting work once again. These quarries are situated in that portion of the Province of Quebec commonly called the Eastern Townships, and have given employment to over 80 hands almost continuously since their first opening in 1864. In 1882 the company re-formed under new management, and in 1886 constructed a tramway to connect the quarries with the Grand Trunk Railway, a distance of over four miles.

The United States has recently opened up quite an extensive export trade both with Great Britain and Australia, and it is a great pity if this field for slate cannot be held in the near future by Canada.

The United States in 1898 produced for home consumption slate valued at $2,353,465, and exported $1,370,075 worth, of which $1,213,377 went to great Britain. Surely this market is worth gaioing.

There have been some improvements in slate quarrying of recent years, chief and foremost being the use of the channeler, a machine which takes the place of blasting—a process which has always been more or less objectional as it shatters and wastes a good deal of otherwise good slate. The slates from the Rockland quarries have always worn well and have proved of superior quality, and compare most favorably with the best Welsh and Pennsylvania slates. The chemical composition is as follows:

Silica S_1O_2	65.39
Alumina	15.97
Ferrous Oxide	4 66
Lime and Magnesia	3.66
Potash and Soda	6.93
Maryonous Oxide	0.39
Loss by Ignition	3.26
	100.26.

This analysis shows at a glance how rich the Rockland slate is in the valuable constituents of a slate, viz., the silicates of iron and aluminà, and if sufficient slate of the highest grade can be found, we can see no reason why an export trade could not be obtained both with Great Britain and Australia, and also probably South Africa.

FIRE-PROOFED WOOD.

The Electric Fire-proofing Company are at the present time erecting buildings near Montreal in which wood is to undergo a process whereby it will become non-inflammable. The result is obtained by forcing sulphate and phosphate of ammonia into the wood by hydraulic pressure, and has been found very satisfactory in so far that the wood only carbonizes and fails entirely to ignite. This non-inflammable wood has been used to a large extent on nearly all the more modern U. S. warships, and in a report from the Naval Constructor to the Secretary of the Navy in March, 1899, he says, after testing for eight months: "That so far as is known there is no better process of fire-proofing wood in use than that now employed by the Electric Fire-proofing Company, and its continued use, for the present at least, is advised."

The science of fire-proofing has of late years been carried to a point not dreamt of ten years ago, and at last architects are beginning to understand that no structure should be called fire-proof unless it is so in every respect. It is almost as sensible for a farmer to build a fence and have the gate open as for a man to build a large building only partly fire-proof. Architects should be more careful of their reputation than to allow a building not completely fire-proofed to be designated a fire-proof structure. Only a small portion, the underside of a steel beam or a single column, unprotected, might cause serious loss to almost the whole building. This fire-proofed wood forms the last thing necessary in fire-proof materials, as there is brick and terra cotta for the walls, porous terra cotta and concrete for the floors and partitions, encasing steel if necessary, and now there is non-inflammable wood for doors, sashes, and fixtures. These materials if employed in a scientific manner, ought to make a completely fire-proof structure, that is, one that is capable of standing a severe fire and water test.

OBITUARY.

One of the landmarks of the building industry in Montreal has recently been removed in the person of the late Mr. Charles Sheppard, whose portrait accompanying this article will be recognized by a wide circle of acquaintances. Mr. Sheppard came to Montreal in 1860 and entered into co-partnership with Mr. Henry Bulmer as manufacturers of building brick. They acquired large tracts of land in the east end of the city, and from a modest beginning their establishment grew to be the largest and most extensive of its kind in the Dominion. The firm of Bulmer & Sheppard continued until 1885, a period of twenty-five years, and then Mr. Charles Sheppard purchased Mr. Bulmer's interests, carrying on the business alone until failing health about three years ago decided him to retire from active pursuits. Since that time his two sons, George J. and Edmund, both well known to the community, have conducted and succeeded to the business. Mr. Sheppard passed away on the 12th of October, leaving a sorrowing widow (who had but a few short weeks before celebrated the anniversary of their golden wedding) and his two sons.

THE LATE MR. CHAS. SHEPPARD.

His death removed from amongst us one more of the staunch men of the old school—a man of honor and probity. One of the most touching tributes to his memory was a handsome pillow of flowers which his numerous employees placed upon his grave, bearing the inscription "Le Maitre." Mr. Sheppard was always ready, in an unassuming way, to assist the needy, and an appeal to him always met with a substantial response.

THE GRANBY ENAMELWARE CO.

The popularity of porcelain enamel iron for all sanitary ware has tempted the Granby Enamel ware Company, of Granby, Que., to start manufacturing enamel baths and sinks. The first baths turned out were slightly defective, both in the flow of the enamel and also in the finish to the edge of the rim, but in the baths now turned out these defects are being overcome. The market for these goods is very extensive in Canada, and we wish the company success in their venture, they being the first as far as we are aware in this line. We trust that the firm will bear in mind that it is indispensable to success that every detail should be carried out with the greatest care, and that no defect should be found in their first quality goods. It is often what may appear a trifling blemish that is the cause of dissatisfaction, and this soon ultimately turns what might have been success into failure.

MINES OF THE PROVINCE.

The following is a summary statement of the yield of some the mines in the Province of Quebec for 1899, that may be of interest.

Nature of Material.	No. of Men Employed.	Gross Value.
Bog iron ore	800	$40,000
Asbestos	900	581,667
Asbestic		17,069
Slate	75	30,119
Flagstones	9	3,500
Granite	60	14,780
Cement	50	31,130
Lime	250	149,000*
Bricks	1200	600,000*
Building Stone	350	250,000*

*Estimated.

The asbestos came chiefly from Megantic and Richmond Counties, the slate from New Rockland, (the quarry at that time was working), flagstones from Dudwell, granite from Stanstead, where there are three quarries, and from St. Philippe, where the Laurentian Granite Company's quarries are situated. There is also work started at Mount Johnson, in Iberville County, where a dark grey granite of good texture has been found. The cement came from Hull and Longque Pointe near Montreal, while the bricks came chiefly from Montreal, Laprairie and St. John Deschaillons.

THE P. Q. A. A.

The Province of Quebec Association of Architects will have a special general meeting on the 15th of January, 1901, in Montreal. Object: Amendments to by-laws and election of an auditor to replace Mr. C. Dufort, who is now a member of the council. Members wishing to amend any article of the by-laws should send in their proposal of amendments to the secretary before the 15th of December next.

THE NELSON MONUMENT.

This monument, erected nearly a century ago to commemorate the battle of Trafalgar, has recently undergone repairs, under the direction of the Munisinatic and Antiguarian Society, and thus restored, was recently unveiled by Lord Strathcona.

NOTES.

Mr. James Ballantyne, the well-known plumber, has recently admitted to partnership Mr. R. F. Oilvy, under the firm name of Ballantyne & Co.

A memorandum recently found in the desk of ex-City Building Inspector Lacroix is said to prove that he retained over $7,000 in fees for building permits, which should have gone into the city

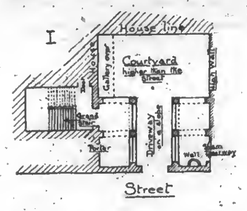
DECISION OF AN IMPORTANT COMPETITION.

Last year the corporation of the town of Levis, province of Quebec, advertised for competition plans to be submitted by civil engineers for the best system of "Waterworks," and "Sewerage" for the town of Levis. Recently the judgment has been given in an elaborate report which indicates a careful and conscientious study of the different plans submitted. The judges were, Charles Baillairge, ex-engineer for the city of Quebec; Chas. E. Gauvin, C.E., Quebec, and Jeremiah Gallagher, C.E., director of Waterworks, city of Quebec, who have awarded the first prize of one thousand dollars to Robert Surtees, C. E., Ottawa, and the second prize of five hundred dollars to Messrs. Berlinguet and Lemay, architects and civil engineers, Quebec.

The parlor of a suburban house is hung with a pale green paper having conventional figures in pale ivory of flambeaux surrounded by garlands powdered regularly upon it. The heavy curtains that separate this room from the hall are dark green velours, through which the dull red finish of the plastered walls in the hall forms an agreeable color contrast. On the parlor floor is a heavy Wilton carpet of a floral pattern, roses on a green ground, while an Oriental rug is thrown on the polished floor in the hall. The furniture is of forest green oak in the quaint style, delicate in outline yet picturesque in form. The upright piano, in a case especially designed to correspond with the other furniture, is also forest green oak. In the hall, Flemish oak has been used for the chairs and the table and mirror frame, a pair of stag horns serving as a hat rack. A tall clock in one corner of the hall is cased in Flemish oak.

SELF CONTAINED HOUSES.

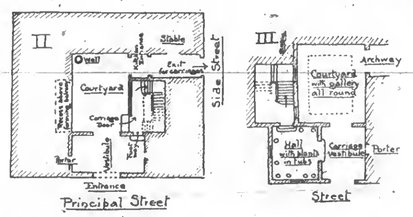
A WALK through the streets of a French or Italian town interests the imagination more than a similar excursion among the rows of houses in an English or American city where ground is precious. Everything is to the front with us. We live on the street, and even in our detached houses there is little in the block plan of the house which is of interest to the dwellers in the house which is not also in evidence to the passer-by. It is different in the southern countries of Europe. Here the highest ideal in domestic architecture is that a house should be self-contained. The more pretentious the dwelling the more it turns its back upon the street and



expands towards internal courts and gardens, free from observation, free from noise, dust and glare; and, though in the south of Europe they are apt to court shade, the same mode of planning can—which interests us most—be made to invite the sun by avoiding a look-out to the north.

The interest of the streets is increased rather than lessened by this method of building, for there is still a façade in most cases; only, instead of a flight of steps there is an archway, of which the gate usually stands open, affording glimpses of interior courts which appeal not only to the imagination but to the eye, as picturesquely diversifying the monotony of street scenery.

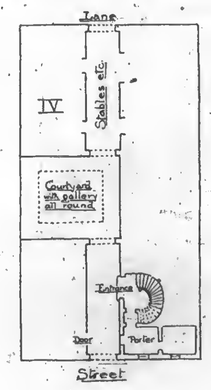
Verona is peculiarly rich in the variety of prospect thus afforded as one walks the streets. The first six plans here shown were hasty sketches made to note merely variety of entrances in that city; but there are added notes of such other keys to the plan as were



apparent to an unobtrusive observer, and the general scheme of the house is fairly clear.

No. I is obviously an interesting peep to the passer-by, as seen through the 8 or 10 foot archway. There is room for much perspective effect in the three lines of arcading backed by the open court beyond. The variety is enhanced by the fact that the driveway slopes and that the steps underneath the arches differ in number The stair is seen through an open archway beyond. There is usually no door to such a stairway; indeed there is no object in having a door for the porter is on guard, there is no exposure to the weather, and in winter the temperature out of doors is milder than that in the house. In an inn the formality of a door even at the top of a stair is often dispensed with; every man's room door is in direct communication with the street. By dint of an open fire place or a cement stove he maintains a little fortress of warmth against the cold world without, and his boots which have lain the night in the icy corridor outside are cold indeed when he takes them in again in the morning. This plan is one of the simpler arrangements; the house surrounds the court yard only on three sides, and there is no exit but the entrance, so that carriages must turn in the court and come out as they went in. The resident of a house of this description would be surprised if asked to step 5 feet across the sidewalk to his carriage, and no doubt would be astounded if he saw some of our good houses where the extent of slat walk to be traversed to get to a carriage on a rainy night is nearer 50 feet than 5.

No. II shows a larger plan in which the house surrounds the court and there is an exit to a side street. Indeed self-contained houses are usually to be found upon a corner lot where they get the advantage of a side street for the second entrance. It would perhaps be better to call this a second exit, for it is usually kept closed except on occasions when there is a procession



of carriages. Tradesmen evidently use it also in this case, as the kitchen entrance is at that point.

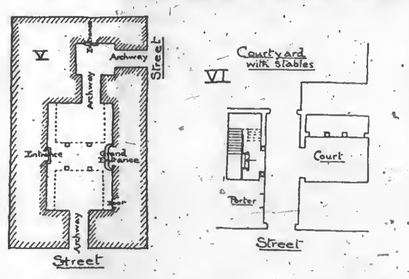
No. III appears to be the entrance of a very handsome house which has not only the second front and exit, but gets light for the hall and staircase by a return on the main front. The hall with plants in tubs makes a beautiful approach to the stairway. There is recorded in the sketch book from which these plans are taken a note upon the effect of trees or shrubs set out in a court yard with the gloom of an arcaded recess behind them. The view from the street through the hall to the staircase is probably intentional as the door to the hall from the vestibule is much larger than is necessary to mate the second door leading to the staircase, but its size just suits the needs of the raking view. The three steps at the staircase door are well placed to add interest to the vista.

No. IV is chiefly interesting as a variety of plan in which the driveway runs through the block. The distance from front to rear, measured approximately by pacing, was 130 feet. The wall on the right gives in plan a long drawn out appearance to the driveway which does not appear in execution, when the archway in the rear is seen as a distant object separated from the first archway by a field of light. The archway is 12 feet wide and the façade about 65 feet.

No. VI has a long archway, but a small court on the right admits light just at the doorway and breaks up the tunnel-like appearance that the archway would otherwise have. The absence of any probable utility for the shallow colonnade on the far side of the court and the fact that it is on the side where it will be seen, suggest the supposition that it is there for that purpose—to further relieve the monotony of the entrance.

No. V is a palace, dated 1668, in which a large court is obtained without much loss of room for the dwelling, by carrying the upper structure across the court on columns. There is plenty of room to drive between the entrance and the next pair of columns, and the height of the superstructure is about 20 feet. The main mass of building is evidently one room deep—room opening into room no doubt in the manner of the time—but passage ways are provided by carrying enclosed galleries, as shown by dotted lines, from the front and back parts of the building to the central portion which rests upon the columns.

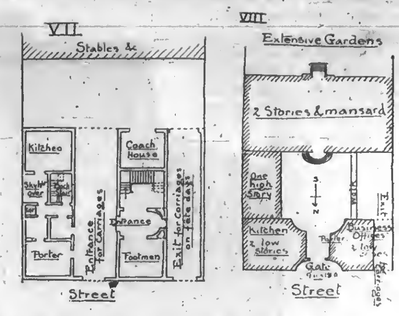
No. VII shows a Parisian residence of the best class. Here as is common in Paris the second driveway opens on the same street as the grand entrance, but there is no danger of confusion; the entrance is more imposing than the exit and the latter is kept closed except on state occasions. The house of course extends over both



openings, the full width of the lot. This is a plan for a building site which runs only to the middle of a block. If the block is shallow and the site runs through to the other side it seems to be preferred in Paris to place the the stables at the entrance and the house on the other street with its front inwards towards the court. There is none of our abhorrence of stables, and no doubt the stables are so well kept that there is no cause for abhorrence. The smaller class of houses, which have no stables and not even an entry for carriages, still make the most possible of the inside of the lot. A Parisian house of modest pretentions still attains to the dignity of facing upon ground of its own by maintaining a garden behind upon which some of the principal rooms look and where the freedom of low windows and an external verandah or gallery of some kind may be enjoyed.

No. VIII represents the British Legation at Paris, which extends entirely through a deep block so that it has not only a handsome entrance front and court but, in the true palace style, a more imposing front looking south upon a garden with no limit but a distant street. This is a splendour so remote from every-day life as to chill interest, but it is wholesome to enjoy contemplating the great problems for they do come occasionally and are apt to be abused from the very habit of not rising above the ordinary.

No. IX, which is the residence of aristocracy in a country town, is perhaps more like the sort of large treatment that would suit our needs. It is a model of quiet dignity. The front, somewhat important from the arrangement of its parts, though quite plain, has the entrance court to itself. A little lower and a little withdrawn is the service department looking into the service yard, which a lofty iron fence, like a rood screen, cuts off, while adding to rather than detracting from the

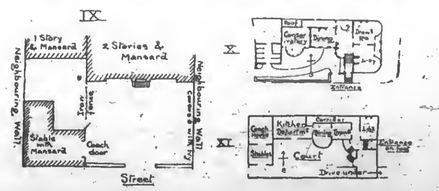


effect of its space. No doubt there is a garden on the other side of this house.

It is interesting to find that the principle of self-contained house planning was adopted by H. H. Richardson in two large houses in Chicago, shown in Nos. X and XI. Both these houses stand on corner lots. Glessner's house, No. XI, is an obvious case of getting a south aspect for a house which would, if facing the street, look north and east. The east aspect has been preserved for the library and a bedroom over the driveway, but the other rooms are made to face inwards to the court and the sun, while the street front is occupied in the most marked manner by a corridor.

In No. X, a house for Mr. Franklin McKeagh, the lot is a corner lot facing south and east so that the recess in plan does not alter the exposure but is designed for its own sake; for the advantage of a certain retirement from the street and for the increased exposure to light on the front side.

It is worth noting in conclusion that a study of foreign plans of this sort shows what a gain it would be



to the plan, how much more freedom we should have in using both fronts for living room purposes, if custom allowed the kitchen department to be put in the basement.

W. A. LANGTON.

Five bronze tablets have recently been placed in the entrance to the Massey Music Hall, Toronto, in memory of the founder, the late Hart. A. Massey, and his eldest son, Chas. A. Massey.

An historical tablet has recently been placed by the Canadian Club on the site, at No. 191½ King street west, of the Home District School, the first building used for school purposes in Toronto.

METHOD OF HOISTING A SET OF LARGE BELLS.

TORONTO, Nov. 18th, 1900.

Editor CANADIAN ARCHITECT AND BUILDER.

SIR,—In answer to your request for information and a description of how the bells are to be hoisted into place in the tower of the New City Buildings, Toronto, I send you the following memos and accompanying section and plan to better illustrate my description.

There are to be three bells; the largest weighs 12,000 pounds and the other two 3,000 and 2,000 pounds respectively.

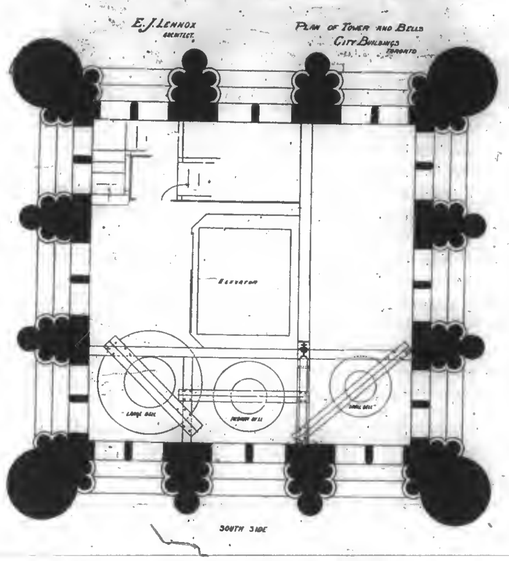
The bells have to be hoisted up on the outside of the tower to the height of about 225 feet, and taken in through the open space for the clock dials, and lowered down about 50 feet in the inside of the tower to their hanging position, which will be about 6 feet above the sills of the large open belfry windows.

In arranging for an undertaking such as the hoisting of these bells, (especially the large one), quite a problem had to be faced, for it must be borne in mind that it is a very unusual undertaking, if, indeed, it ever has occurred before that a bell of the weight of the large bell, viz., 12,000 pounds, had to be hoisted up on the outside of a building to the height that this bell has to be hoisted, before it could be delivered down into its resting place. All this trouble and expense is incurred for the reason that the contract for the clock and bells was not let in time so that other provisions might have been made for the placing of these bells. I do not, however, fear for the success of the undertaking.

I would also draw your attention to the fact that when the large 6-ton bell is hoisted it will not have been the heaviest load that has been raised to the top of the tower. One of the most precarious undertakings in the building of the tower was the hoisting of some of the finishing stones, amongst which was the raising and placing in position of the four large Gargoyles, each of which weighs 14,000 pounds, and when placed project out 9 ft. 6 in. beyond the face of the angle buttresses of the tower, and tail in on the wall about 6 feet, making the total length about 15 feet. But in the hoisting of the gargoyles I used the derrick and tackling that I had especially designed and constructed for the purpose of carrying on to completion the construction and finishing of the tower. I merely mention the fact to show that the weight of the large bell is not to be feared in connection with the hoisting, but the great difficulty is in having to undertake the hoisting of such a weight as this with appliances and tackling that can only be temporarily erected for the purpose. After a good deal of consultation between the clock and bell contractor's foreman, and sub-contractor, who has undertaken the contract to hoist the bells, and myself, the following plan has been decided upon:

THE LARGEST OF THREE BELLS TO BE PLACED IN THE TOWER OF THE NEW MUNICIPAL BUILDINGS, TORONTO. HEIGHT OF BELL, 6 FEET; DIAMETER, 6 FEET 8 INCHES; WEIGHT, 12,000 LBS.

At the top of the tower opposite the south dial will be erected a shear-legged derrick firmly planted on heavy timber base, on projecting ledge of tower, and anchored in at foot so that it will not shear out, but so formed that it will not retard the inward movement of the derrick. The head of the derrick will hang out from the face of the tower far enough to allow the bell to be hoisted clear of all projections. At the head of the derrick will be fastened the hoisting sheave rigged up with two ⅝-steel wire cables, each capable of sustaining 10 tons. These cables will extend from the top of the bell while on the ground, up to the hoisting sheave and down to the drum of the hoisting engine which will take in the slack. The top of the derrick will be anchored back at head to keep it in its outward hanging position. To the head of the hoisting derrick will be fastened another steel wire cable brought back into tower through sheaves and down to a crabwinch; this cable will be used for drawing in the head of the derrick. At a few feet below the level of the height that the bells are to be hoisted up to, before they are hauled into the tower, will be a strongly constructed, projecting platform erected to receive the bells. The platform will be anchored back into tower, projecting just far enough so that the bell when being hoisted will pass quite close to the edge of same. There will also be properly rigged-up on the inside at the top of the tower a hauling in hemp cable, capable of sustaining at least a weight of 10 tons. On the ground at the foot of the tower will be erected a steam hoisting engine and drums.



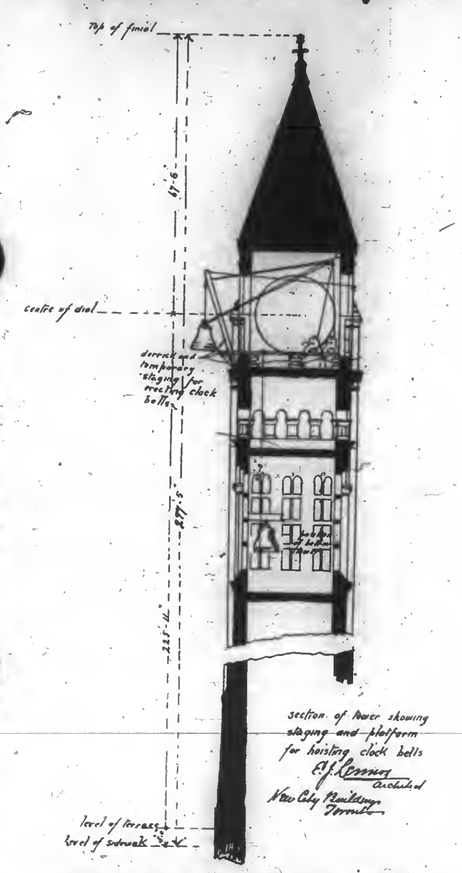
The process of taking up each bell will be, that it will be hooked on to the hoisting sheave at end of cable hanging down derrick and steadily and carefully hauled up by the hoisting engine until it reaches a height of several feet above the level of the projecting platform. Then the head of the derrick will be hauled in until the bell hangs over the platform, when it will be gently lowered down on to rolling skids, and pinched into the required position.

The bells having reached this position it will be an easy job to lower them down into their place with overhead tackling hung from beams in the top part of the tower; they will then be blocked up into position until they are bolted up to the heavy framework of steel beams, when blocking will be removed and they will hang clear fastened to beams.

In conclusion, I might say that every precaution is to be taken; the scheme has been carefully thought out, and I have no reason to think other than that the bells will be carefully landed and swung safe and sound into their position without accident.

Yours sincerely,

E. J. LENNOX,
Architect.



ENGINEERS' CLUB OF TORONTO.

The meeting of the Engineers' Club for November was held at the new club rooms which have recently been fitted up at 94-96 King street west. About thirty members were present. Reports of several committees were received.

Mr. T. B. Speight tendered his resignation as treasurer, owing to the fact that he expected to be absent from the city for several months. Mr. Canniff was appointed as his successor.

The following committees were appointed:

Finance Committee—Messrs. H. F. Duck, Jas. McDougall and A. F. McCallum.

House Committee—Major Gray, R. J. Parke, and A. B. Lambe.

Library Committee—Messrs. W. T. Jennings, W. H. Patton, and W. A. Clement.

A resolution of thanks was voted to the proprietors of the Rossin House for providing a room for meetings of the Club during the past year.

Notice was also given of several proposed amendments to the Constitution which will come up for discussion at the next regular meeting.

The Canada Asphalt Paving Company has been incorporated, with headquarters at Montreal. The capital stock of the company will be $50,000. The incorporators are Messrs. R. L. Dillon, J. St. G. Dillon and A. P. Dillon of Montreal, and James A. Pearson, A. W. Godson and J. H. Denton of Toronto.

METHOD OF CONSTRUCTING A WOODEN ELEVATOR.

The erection of a modern elevator is a task of no little magnitude, and entails many different principles of construction.

Though the steel framed elevator is now commonly used and seems to the architect of other modern build-

No. 1.—(A) Cement Piers. (B) Sized Lumber Piles.

ings, to be perhaps the only correct method of construction for such enormous erections, yet some of the largest elevators in the Dominion and elsewhere embody largely the simplest and earliest methods of construction.

The accompanying illustrations show very clearly this method of building—substantially that of the settler of the primeval wilderness when he puts up his log cabin.

This is one of the largest sized elevators, yet its builders claim for it advantages which, on the whole,

No. 2.—Shows Tratelling Cranes and Method of Erecting Trusses.

cannot be surpassed by any other character of building. It is much cheaper than the steel building in material, and its cost in erection is far below that of the other. Its rigidity is remarkable, and the dangers from side thrusts are entirely obviated.

Grain in bulk, wheat particularly, asserts great side thrust, being in reality a semi-fluid, and acting similar to water. A glance at illustration No. 5 will show how entirely this force must be overcome, the building being so bound together by its own divisions and bins as to be incapable of crushing, and bulging being impossible.

The illustrations are from photographs of the work upon the new I.C.R. elevator in St. John, N.B., and show very clearly the character of construction, method of operation, and, by the dates in the corners, the progress upon the work. This building was erected by Mr. J. A. Jamieson, of Montreal, who is perhaps the best known elevator builder in Canada, and has the reputation of being a most up-to-date contractor and designer in this line.

While the foundation was being prepared a mill was being fitted up with machinery immediately adjoining for the cutting up of the lumber into the various sizes required. This work was completed and the lumber

No. 3.—Sub-Timbering Complete—Planking just Begun. (A) Mill belonging to the Works. (B) Sized Planking. (C) Lumber Slides—fitted with Rolls

stacked in sized piles all ready for use before the construction began.

This method greatly facilitates matters, as the construction is proceeded with almost mechanically in its various stages.

No. 1 illustration shows one of the 98 cement piers in the foundation. No. 2 shows the character of the timberwork (Georgia pine) resting upon these, and illustrates the methods and simplicity of its erection.

The trains of cars are run into this lower part of the completed structure, and it also contains much of the machinery requisite to the elevating. From here up-

No. 4.—Illustrating Sub-Timbering, Plank Mid-Structure, and Timbering of Superstructure.

to what might be termed the clerestory, the entire structure is of 2x7 spruce planking, laid on the flat and spiked every few feet alternately near the opposite edges with 5-inch wire nails.

No. 3 shows the first few courses of this planking laid, and shows the lumber carriers, made up of a series of horses fitted with rolls, which may be seen more clearly in No. 5. The lumber is elevated to these

carriers at one end (the farther end in No. 3), and is then shoved along horizontally to its desired position. As the structure rises layer by layer, the carriers are elevated accordingly as often as necessary, being so designed that they interfere none whatever with the work, as is shown in No. 5. This is a peculiarly designed carrier and a most effective one.

No. 5 also illustrates the platforms for the workmen and the character of their supports in such a way as to be almost needless of explanation. The wedge brackets can support the platforms at any height as the work

No. 5.—(A) Wedge Brackets. (B) Wedge Brackets in Service Supporting Platforms. (C) Movable Platforms. (D) Lumber Slides in Position. (E) Rolls.

proceeds, and these are raised as fast as the planking rises.

Close inspection of the picture shows that cross and longitudinal layers of plank lap alternately. This view is taken at a height of 60 or 70 feet from the ground.

No. 4 shows the exterior of the planking when completed, the perpendicular lines being the ends of the cross planking. It is now ready for the galvanized iron covering which makes the outside finish.

A. B. Pickett.

Oct. 31st, 1900.

THE INTERCEPTING TRAP.

The Builders' Journal, of London, reproduces the correspondence lately published in these columns on the above subject, and comments thereon as follows :—

"Our readers will probably be astonished, not so much at the diversity of opinion, as at the backward state of sanitation in our great colony which these reports appear to indicate. True, our sanitarians have not yet discovered the best method of ventilating sewers, for indeed ventilation, whether of rooms or sewers, appears to be the most difficult subject with which the modern engineer has to deal; yet we thought by this time it was a generally accepted principle that the house-drainage system should, as far as possible, be separated from the main sewerage scheme. But apparently the Canadian system in the past has been to ventilate the main sewers by means of "breathers" or gratings at ground level in the front gardens, and it is hardly surprising, therefore, that our Canadian confrères are desirous of altering a condition of things that is both dangerous and unpleasant. At the same time to make the soil pipe the means of venting the sewer air does not by any means lessen the danger, for only the water seals of the water-closets and gulleys prevent the ingress of sewer air into and round about the house. If, as several of the writers point out, the tops of the soil pipes are frequently choked by frost, any pressure of the sewer gas will force the water seals and enter the house. This new evil would probably be worse than the original trouble. If the sewers are to be ventilated, they must be ventilated below the disconnecting trap, so that no possible danger of sewer gas forcing its way into the house system may be apprehended.

ILLUSTRATIONS.

Sketch for suburban residence.—J. Rawson Gardiner, Architect.

Residence, Rosedale, Toronto.—Beaumont Jarvis, Architect.

Church of St. Clement, Brooklyn Avenue, Toronto. Bond & Smith, Architects.

Men-wah-tay Lodge, Rock Lake, O. and P. S. Railway. W. H. Watts, R.C.A., Architect.

AN ATTEMPT TO BRIBE ARCHITECTS.

The following correspondence has been forwarded by Messrs. Burke & Horwood, architects, of Toronto, in the hope that its publication may deter other manufacturers from adopting a like foolish line of policy. The words underscored were underscored by the United States firm who are the authors of the proposition.

(Copy).

Racine, Wis., 11—1—1900.

Messrs. Burke & Horwood, Toronto, Ont., Can.

Gentlemen: We note through the different contractors' journals, that you are designing and constructing many buildings. We believe there is much of mutual interest in our profession and line.

We wish to inform you and make you familiar with our entire system, so that in the planning and construction of your work you can recommend some of these devices which seem most practical, and for every building that is equipped through your recommendation and plan, you are to receive 5% on the contract price.

We would be pleased to have your views regarding this plan. We now have two or three hundred architects working with us, and we propose interesting the majority of the leading architects of the entire country. You can give us the name of the parties with whom you are dealing, or furnishing plans, and we will correspond with and give them all the information possible, and with your consent refer them to you, as a disinterested party as to your views on the subject.

Hoping to receive a favorable expression from you, we are

Yours very truly,

Racine Fire Engine & Motor Co.

R. B. Sigafoos, Pres.

We are not members of the Fire Apparatus Trust.

(Copy).

The Racine Fire Engine & Motor Co., Racine, Wis.

Dear Sirs,—Yours of the 1st inst. is received, asking us for our views regarding certain statements in your communication.

In the first place, we have to state that you are making a great mistake in offering a commission. No reputable architect will have anything to do with such a proposition; it is entirely against all the best traditions of the profession.

Second—an architect who accepts such a commission cannot be a "disinterested party."

If your goods are what you claim for them, they should carry their own recommendation without the necessity of a bribe to the man who should, of all others, judge by the merits of the article he is recommending, from an entirely unbiassed standpoint.

Our advice to you would be to send out no more such offers to the profession, if you want to retain the good will of all right minded architects.

Yours truly,

Burke & Horwood.

Architect—"We've settled about the design for the drawing room. Now, as to the study; how do you want that finished?"

Nurox—"I seen in a newspaper once about a study in black and white that was very artistic. Suppose you gimme one o' them?"—Philadelphia Press.

NOTES ON THE FIRE AT PARIS, ONT.

In answer to enquiry, Mr. John Kay, architect, of Paris, Ont., has kindly supplied the following notes on the recent destructive fire in that town :

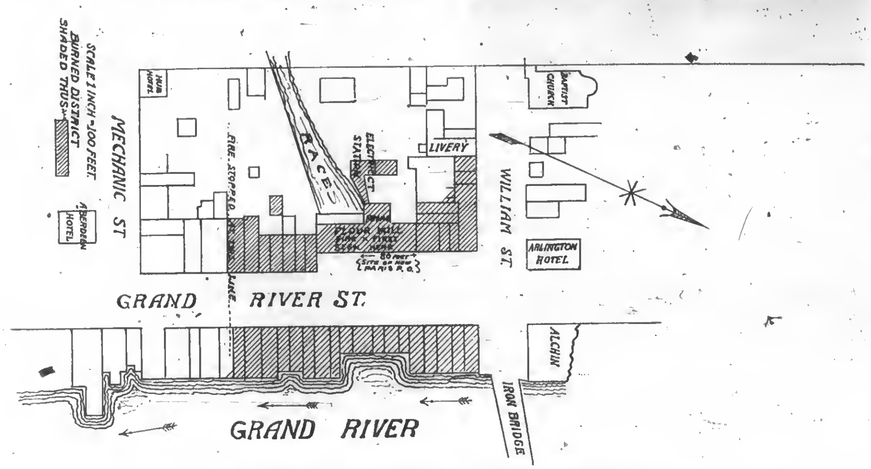
"As to our big fire on the 12th inst., it started in Mr. Meldrum's flour mill, a frame building 150 feet long by 45 feet wide, posts 30 feet high; posts 8 feet apart, 12 x 12 ; beams and posts in centre, 12 x 12 ; joists, 4 x 10 ; shingled roof with a cupola, 10' x 14', 6' high on top of ridge, with louvres which acted as a chimney. This caught fire, and in a short time the flames were everywhere—first breaking the glass and leaping up the clapboards. I never saw a better constructed fire with a gale from the west estimated at a 50 mile gait.

The fire blew across the street and the plate glass melted and ran like molasses. The stores along the east side of Grand River street were first class—some rooled with slates, but mostly metal (Garry iron) laid on tarred felt ; plate glass windows. Patton's hardware store was next the mill on the north side. Kegs of nails were fused into one solid mass. The embers flew across the Grand River, and set on fire the dwellings on the opposite side of river. The floor of William street iron bridge 130 yards long was on fire in many places ; a bucket brigade managed to save it. The mill in question was built 50 years ago and the building sites are few (the lower town where the fire occurred being in a hollow with hills around three sides and the river on the east,) and buildings were close up to the mill in front and on each side. The heat was so great that the water thrown with 80 lbs. per sq. inch seemed to go up in steam before it had a chance to put the fire out.

The town by-law forbids the rebuilding of such a structure as this mill. Brick and stone can only be used in walls. Paris previous to 1832 was called the Forks of the Grand River, since then it has been Paris. The mill in question was built in 1842 about 10 years before the railway reached the place. I am safe in saying that every building burnt on the 12th of September has been erected since the mill was built.

Paris has had fires in stores but the firemen managed to keep the fire within the walls where it started. In Randal's block there were three different fires without much damage to brickwork. This time, however, the lintels are so burned that the whole front will require to be taken down and rebuilt on new timbers.

Find enclosed a sketch showing position of burnt buildings. Already men are at work clearing out the cellars. Brick walls will take the place of lath and plaster partitions. Although lumber and hardware is dearer, money is cheaper. On the whole I am of opinion the fire was a blessing in disguise. A fine new Post Office, Custom House and Inland Revenue Building will occupy the site of the old mill. Pressed brick fronts with stained mortar will supersede the Princeton bricks. More vaults will be built—the contents of some of the so-called fireproof safes were worthless. Prism glass will be used to throw the light to the rear of the stores. The new buildings will have a proper grade corresponding with the centre of Grand River street. Before the fire the sidewalk would be level with the door sill of one building while next door the sill would be 8 inches above the sidewalk, and so on, giving the streets a very unseemly appearance.



Sketch Showing Burned District at Paris, Ont.

PERSONAL.

The sympathy of a wide circle of friends is extended to Mr. John H. Tilden, president of the Gurney-Tilden Co., of Hamilton, who has recently been bereaved of his wife.

Mr. P. W. St. George, city surveyor of Montreal, has tendered his resignation on the ground that he can no longer put up with the interference and discourtesy of the Road Committee. Mr. St. George has been in the employ of the city of Montreal as deputy city surveyor and city surveyor for a quarter of a century.

STUDENTS' DEPARTMENT.

C. A. & B. STUDENTS' COMPETITIONS.

The publishers of the Canadian Architect and Builder invite architectural students and draughtsmen resident in Canada to submit drawings in the following competitions:

STUDENTS' COMPETITION FOR A PORCH.

A plan, section and perspective sketch are required. Explanatory detail sketches of certain portions may also be included.

The subject is an entrance porch to a city house of 35 feet frontage facing south or east on a 50 ft. lot. The porch to be large enough for use as a verandah, and yet not to cover all the front windows, as it is desirable to have the sunshine enter the parlor by at least one window.

The porch may be of wood, brick or stone or combinations thereof and may have flat or sloping roof.

STUDENTS' COMPETITION FOR ENTRANCE DOOR, VESTIBULE AND VESTIBULE DOOR.

A plan, and section are required and elevations of both doors.

Explanatory detail sketches of certain portions may also be included.

The subject is the entrance from the above mentioned porch. Light may be obtained for the vestibule from a window on one of the walls not occupied by the doors, or from the entrance door or wall in which the door is placed.

The vestibule must be large enough to accommodate a fair sized hat rack and an umbrella stand.

Drawings must be made with pen and perfectly black ink on white drawing paper or cardboard. No brush or color work will be allowed. Drawings should be so arranged as to admit of photographic reproduction in the illustration pages of the Canadian Architect and Builder. The size of each page is 7x10 inches. No set of drawings must occupy more than two pages.

Competitors must send in their drawings, prepaid, under motto marked "Students' Competition," and addressed to "the publishers of the Canadian Architect and Builder, Confederation Life Building, Toronto," prior to 5 o'clock p.m. of the dates set for the competition, viz ; 1st competition, Thursday, 27th December, 1900 ; 2nd competition, Monday, January 28th, 1901. Each set of drawings must be accompanied by a sealed envelope bearing on the outside the author's motto and enclosing a card giving his full name and address.

The merits of the designs which may be submitted in in these competitions will be judged by a committee of the Ontario Association of Architects, whose decision shall be final. For the benefit of competitors, the judges will be requested to give a detailed criticism of each design.

Three prizes are offered in each competition as follows : To the winner of 1st position, $10 ; to the winner of 2nd position, $5 ; and to the winner of 3rd position, one year's subscription to the Canadian Architect and Builder.

The right is reserved to publish any or all of the drawings.

Note.—Competitors are required strictly to observe and comply with the above instructions and conditions.

EXHIBITION OF ARCHITECTURAL DRAWINGS.

The members of the Toronto Architectural Eighteen Club have made all arrangements to hold their first annual exhibition from January 26th to February 9th, 1901, at the galleries of the Ontario Society of Artists, King street west.

The above Club joined the Architectural League of America nearly two years ago and have been working on having an exhibition of American and Canadian drawings ever since. The success of the exhibition is assured ; not only has every American club promised to give every assistance, but also many of the leading architects and the following gentlemen have kindly consented to look after the Eighteen Club's interests in their various cities : Adin B. Lacey, Philadelphia ; N. Max. Dunning, Chicago ; Chas. D. Maginnis, Boston ; Edwin G. Gardin, St. Louis ; Gustave W. Drach, Cincinnati ; Julius F. Harder, New York ; John T. Comes, Pittsburg ; Percy Ash, Washington ; Prof. Newton A. Wells, Urbana.

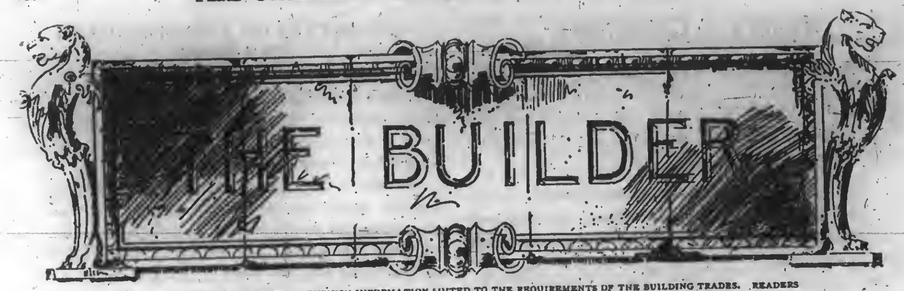
Beside the various drawings which the Eighteen Club will receive from individual architects and draughtsmen from the United States and Canada, there will be an exhibit of circuit drawings of the Architectural League of America consisting of about one hundred and twenty-five of the best drawings made during the year. An illustrated catalogue will be issued and distributed free to Canadian architects, and it is the desire of the Toronto Architectural Eighteen Club, that every architect in Canada will send in his name and address to Ernest R. Rolph, secretary, Bank of Commerce Building, King st. Toronto, as it is only through the medium of this publication that they can be reached, and for that purpose have inserted an advertisement on page vii.

The above Club is issuing a special circular with all information re this exhibition, along with invitations to all Canadian architects and draughtsmen to contribute drawings, and it is hoped there will be brought together the best collection of Canadian work ever seen.

THE TORONTO HOTEL.

The announcement is made that the financial arrangements necessary to insure the erection of the proposed Toronto Hotel, have been completed, and that contracts for the construction of the building have been awarded. The plans for this important building have been prepared by Mr. Henry Ives Cobb, of Washington. The building will front on King, Victoria and Colborne streets, the main entrance being off King street. There will also be a second entrance off Victoria street. These entrances open into a rotunda 80x90 feet. The remaining frontage on both these streets will be fitted up as shops. The general dining room, banquet hall, assembly room and state apartments will occupy the first floor. On the succeeding five stories will be sixty bed-rooms with forty-two bath-rooms. The total cost of the land, building and furniture is placed at $1,500,000. Aside from the public need which this building will supply it promises to form an important addition to the architectural features of the city, and a help in maintaining values of business property east of Yonge street.

J. C. Killam & Co., of Moncton, N. B., who have secured the contract of strengthening, readjusting and covering the Memrancook bridge are now at work upon it. This firm makes a specialty of bridge building and have built quite a number in Nova Scotia and New Brunswick. They built the Long Creek bridge in Queens County, N. B., last summer.



[THIS DEPARTMENT IS DESIGNED TO FURNISH INFORMATION SUITED TO THE REQUIREMENTS OF THE BUILDING TRADES. READERS ARE INVITED TO ASSIST IN MAKING IT AS HELPFUL AS POSSIBLE BY CONTRIBUTING OF THEIR EXPERIENCE, AND BY ASKING FOR PARTICULAR INFORMATION WHICH THEY MAY AT ANY TIME REQUIRE.]

For the Carpenter and For the Mason.

Both carpenter and mason are often confronted with problems in arched work. The first, because it is his duty to make all centers and frames required to be built even or round, the second, because it will be necessary for him to obtain the proper bevels and lines for forming the voussoirs and key-stones of his work. The construction of centres may safely be left for future consideration, providing the manner of obtaining the outlines of the work be fully grasped by the operator. It is generally the carpenter who prepares all the paterns for the mason, and who lays out the radial lines and the curves for both exterior and interior, but there are occasions when the mason is compelled to obtain the lines for himself. The following illustrations are arranged to suit both craftsmen.

Elliptical Arches.

At Fig. 1. an arch is shown which is semi-elliptical, and is drawn by means of a trammel, or by aid of a string, as has been described in this department in previous issues. The arch is divided into sections or blocks of the proper size, and this is done by first dividing the curve into any desired number of equal spaces, then, wherever the joint is required, first draw a tangent to the curve from which square draw a line touching the joint where the joint is wanted, and this will give the proper radial line as shown at s. Fig. 2 shows a Tudor gothic arch formed by two parts of an ellipse. The manner of getting the curves for this arch is shown by the dotted lines, where the two rampant semi-elliptical arches are displayed. The curves are obtained by the same method as described in Fig. 1, and the lines of joints are found by the same method as shown in the previous example.

Semi-Circular and Segmental Arches.

To draw the lines for a semi-circular arch is a simple matter, as all the radiating lines for joints and for the keystone are drawn from a common center, o, Fig. 3. The springing line is also a radial line, being on the same plane as the center o; the illustration explains itself. Segmental arches are more difficult to lay out than semi-circular ones, as the center from which the curves and radial lines are drawn is outside of the area of the arch and its chordal lines. A method of finding the center of any segment is shown at Flg. 4. Let A B C be any three points in the arch, all we have to do is to connect A B and B C by straight lines. Then from the center of A B, and from the center of B C, square down until the lines intersect at D, as shown, then the point D will be the center of the circle of which the arch is a portion. Thus, if we make A C the points from which the arch springs, and square up from the center X, and measure the height of the arch to O, we will have the three points through which the arch will cut. This method is, perhaps, better shown in Fig. 5, where a h b show the width and height of arch. The curves c d are

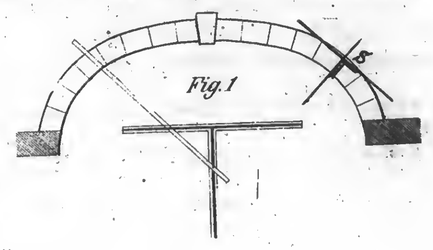


Fig. 1

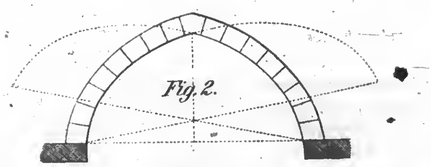


Fig. 2.

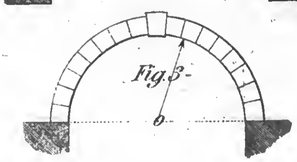


Fig. 3.

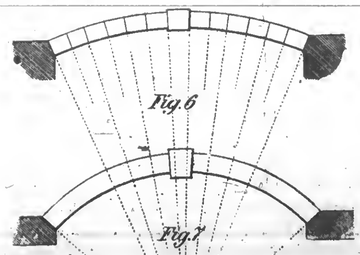


Fig. 6

Fig. 7

drawn from the center a b, and the line c d g is drawn through the points c d. The curves e f are drawn from the center a h, and the line e f cuts through the center of the required circle at g. Two segmental arches, drawn from one center o, with different radii, are shown at Figs. 6 and 7. The joints and springlines are also shown. Fig. 8 exhibits an equilatoral gothic arch. This is described by two equal radii from the points o o, as centers, and jointed from the same points. Lancet gothic arches are drawn with a greater radius, having as centers points beyond the center, o o, with he lines of the curves starting from the points as shown in the diagram. A much flatter gothic arch is shown at Fig. 9, the centers for the curves being within the span of the arch, as shown at o o. Gothic arches of any degree of acuteness may be obtained in the manner shown at Fig. 8, it only needs to use a greater radius when making the curves. The same also applies to

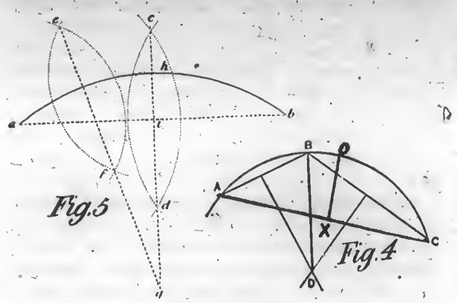


Fig. 5

Fig. 4

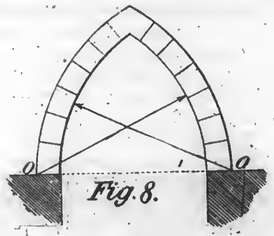


Fig. 8.

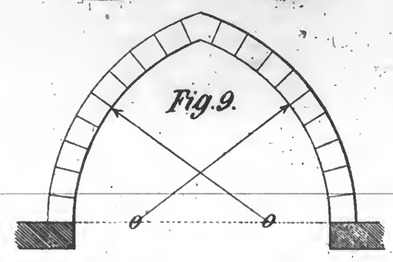


Fig. 9.

flat arches; the nearer the radius is to a semi-circle the flatter the arch will be.

Other Arches.

Besides the arches we have illustrated, there are many others, among which may be mentioned, flat arches, of which there are various styles, and which are used over square top sash and door frames, and for lintels over open fire-places, and other similar purposes. There are also various kinds of Moorish or horseshoe arches, and of arches with semi-circular soffit, and a gothic outline outside, also rampant or raking arches, skew arches and arches that are inverted, as well as relieving arches. There is also an arch called the winged auch, in which the voussoirs are continued on horizontal line of the spring to some distance beyond the face of the inside wall or jamb. The different styles of arches and the manner of working them, and obtaining the lines for their construction, will form ample material for further comment. There are other classes of work, such as forming arched windows in circular walls that will surely be of interest to those engaged in the construction of buildings. To the carpenter, a thorough knowledge of lines pertaining to such work as has been described in these pages, is indispensable, for on him devolves the duty of laying out pretty nearly all the work of a constructive nature about a building.

THE LATE G. H. WALLACE.

The death of Geo. H. Wallace, contractor and builder, of Sussex, N. B., is to be deeply regretted in the trade, which loses thereby one who has been eminently respected at all times and who took an active part for many years in the building up of his province.

The Late G. H. Wallace, Sussex, N. B.

The deceased was a native of Nottingham, Eng., where he was born in 1827. He received a good education, and at an early age entered the army, in which he served some years in both Scotland and Ireland.

In 1848 he came to Canada and settled in Sussex where he worked at his trade as a carpenter and builder. In late years he was a justice of the peace, a stipendiary magistrate, and in 1879 was made collector of customs, which latter office he filled until his death.

Four children survive him: Mrs. A. D. Sharp, of Campbellton, Mrs. Quigg, of Boston, and two sons, F. W. and W. H., who comprise the present firm of Wallace Bros., contractors and builders.

A new factory, 100 x 560 feet in size is in process of construction at Walkerville, Ont., for the Ontario Bridge Works. The structure will be a steel frame, fireproofed, and will cost $20,000. The company will employ 150 workmen in the manufacture of steel bridges, roofs and building material.

Attention is called to the announcement in this issue of the Imperial Varnish Company of Toronto. This company are manufacturers of high grade varnish for architectural and other purposes. Architects and others of our readers who have occasion to specify or use this material would do well to look into the merits of this company's goods.

According to Leslie's Weekly the Chinese are a nation living in brick houses in a land without a brick-making machine. All the millions of homes in the thousands of walled cities are built of brick, and every brick made by hand. These bricks are made by labor costing but 10 cents per day, still they cost more than our machine brick made with labor costing 25 times as much.

THE PROTECTION OF PUBLIC BUILDINGS FROM LIGHTNING.

MR. KILLINGWORTH HEDGES, who has been advising on the re-arrangement of the lightning conductors on St. Paul's Cathedral, recently read a paper on the above subject before the Royal Institute of British Architects. He quoted from a paper read before the same Institute by Col. the Hon. Arthur Parnell in 1884, in which an analysis of a number of disasters to buildings fitted with lightning rods showed that there were 828 separate instances of mechanical force, as against only 228 of heat, exercised on various substances by lightning. Mr. Hedges also repeated Dr. Lodge's statement that the problem does not end with the actual rod, owing to the large difference of potential existing between the conductor and earth, however well the two are connected. He expressed himself in agreement with Dr. Lodge as to the oscillatory nature of the discharge, and expressed the view that the side flash was the result of self-induction in the conductor. On one matter, however, Mr. Hedges' theory was somewhat remarkable. He considered that when a discharge occurred at one point between the thunder-cloud and earth, a corresponding discharge occurred in the reverse direction at another point of the cloud. He referred to these as the "downward" and "upward" discharges, and stated that he had frequently seen in Colorado "upward" flashes arising from the ground! In connection with available reports and statistics of lightning accidents, Mr. Hedges regretted that no official reports of this nature had been published since that of the Lightning Rod Conference in 1882.

Not the least interesting part of Mr. Hedges' paper was a description of the lightning conductors attached to several important buildings abroad. On the Notre Dame Cathedral, in Paris, the main conductors are three in number, each of the two on the towers commencing at a massive wrought-iron terminal rod about 20 ft. high and 4 in. square at the base. To this a wrought solid iron rod about 1 in. square is secured by straps, and run in lengths, jointed at intervals, over the roof and outside the tower to the ground. This rod is supported about 7 in. from the lead roof and stonework by stanchions insulated by half-round stone or porcelain insulators secured by shackles. At a later period a copper strip had been connected to each of the conductors at the roof and run independently to the ground below. The spire has an elaborate finial with numerous points and this appears to be connected to earth in a similar manner, and also to the crest running along the ridge of the roof. The speaker considered this method of protection to be a source of danger at present. The flash received by one of the main rods had two paths open, one by the old iron conductors and a second by the new copper band. The current could be prevented from dispersing over the lead roof by the insulators of the conductors, and owing to the resistance of the joint would consequently jump from the central rod to the small copper one.

On the Cologne Cathedral he considered the protection far more advanced than that of Notre Dame. Stranded copper cables are used, run through galvanised iron stanchions with flat feet by which they are bolted to the stonework. To avoid galvanic action, the eyes of these supports are bushed with lead. They keep the conductor about 7 in. away from the structure so that the cable can be stretched tight by tightening screws and not run round projections. A somewhat similar arrangement is used for the horizontal conductors which run each side of the roof and are kept away from it. The terminals of the lightning rods, Mr. Hedges continued were almost always plain spikes without branches, but German buildings had many of these both on the highest portions and along either the tops of the walls or ridge of the roof, the whole being connected together by a horizontal conductor run in the method described. A timber shed near Frankfort had these vertical rods about 15 ft. apart and a petroleum storage tank at intervals all round its circumference.

The lightning conductor of the Palais de Justice of Brussels is very similar to that of the Hotel de Ville, which has been described in text-books. It is on the Melsen system, and consists of a network of metal rods connected together at the top and furnished with an aigrette or bundle of eight 4mm. copper rods spread out like a feather, so that, after passing over the roof, the terminal points project so little that they can hardly be seen from below, yet they break up the area of the buildings and leave little space unprotected. The conductors are of copper, but where they descend a special iron box is employed in which they are embedded in zinc, and from this the down rods can be continued in iron and also connected to the rain-water pipes and other ironwork of the building. The Palais de Justice was struck soon after the lightning conductor was completed, but no more damage was done than the partial fusion of some of the points of the aigrette which received the flash.

French architects, Mr. Hedges said, seem to prefer the long single point. The standard rod or tige is 6 metres high and about 6 cm. diameter at the base, tapering to nothing at the top. The rod is firmly connected to the woodwork of the roof, and the copper or iron conductor is fixed at the base by means of a shackle. The conductor is usually kept away from the building by supports, and is carefully led into moist earth—or, in the case of rock foundations, it is connected to a network of wires running for a considerable distance under the surface. Where a well can be used, the earth connection is prepared by plaiting up galvanised iron strips to form a basket, which contains a sort of grapnel, the latter being attached to the conductor and the basket being filled with coke and lowered into the water.

The method adopted in most American cities at present, the speaker continued, is the employment of a round iron rod about half-an-inch in diameter, extending from the ridge of the metal roof about 4 ft. above the top of the chimney or other elevated projection, its lower end being connected to a piece of iron in the form of a saddle, soldered to the metal roof. To this the top of each rain pipe is joined, or, where the gutters are below the roof, special tinned iron strips connect the two. It is said that each rain-water pipe 4 in. diameter is equal in capacity to an iron rod 9-16 in. diameter. The connection between the pipe and the earth is made as follows: Above the elbow portion, a galvanised socket is fitted, and to this is soldered a flat bar which is led directly to the nearest water pipe or to the earth. The form which seems to give the best results, he said, is constructed of a pipe driven into the ground so that its perforated end rests in moist earth; its upper end is left about 6 in. below the surface, so that it can be watered artificially or by rain. To assist the collection of moisture a larger sleeve is placed outside, furnished with a perforated top and set flush with the gutter. With slate or wooden roofs, bands of tin plate or galvanised iron are often placed underneath the slate covering on the rafters of the roof, being connected at the top with the "air terminal" conductors, and below with the gutters and rain-water pipes as previously described; in the case of a Mansard roof the sheet metal or flushing is also connected to the system.

Mr. Hedges was called in, in 1898, to report on the condition of the lightning conductors of St. Paul's Cathedral. He was informed that they were put up in the year 1872, having taken the place of the original system erected under the advice of the Royal Society about 144 years ago. The conductors were throughout of ½ in. stranded copper. Four of these conductors passed from the iron supports of the cross down the outside of the dome branching into eight conductors which were cross-connected by the railing of the gallery. Lower down they were united together and carried down to the ground. Each tower had two conductors with a cross connection, and there was also a single conductor passing over the ridge of the choir to earth on either side. In the metallic connection with the cross there were several iron straps passing down inside to the level of the gallery, where the ends apparently disappeared in the stonework. This, in Mr. Hedges opinion, constituted a danger. The statues on the three sides of the building were not protected. The earth connections were also most unsatisfactory. These had originally been laid in a brick sewer passing around the building but in alterations since executed, earthenware pipes had been laid within the sewer, the brick sewer being no longer employed, and the conductors were therefore left either resting on the top of the earthenware pipe or placed within them so that they were insulated from earth. The joints were in all cases wrapped and not soldered.

The plan of re-arrangement recommended by the author, taking into consideration the large amount of copper cable already disposed about the building, was to run three new cables from the metal-work of the framework supporting the cross to the roof of the dome (making interconnection with the iron supports of the structure); there connecting them with the eight existing conductors and reuniting them at the base of the dome to the existing system, which was to be increased by running a new ½-in. seven-ply copper cable on the top of the parapet entirely round the building. From this horizontal conductor, aigrettes, consisting of five pointed copper rods, were teed at intervals by means of special brass boxes tinned inside, into which the cable was placed, the aigrettes first secured by binding, and the whole united by running in hard solder. Great difficulty was found in securing new earths. One set of conductors was united to the hydraulic main supplying the power to the organ, and the other to the 8-in. water main. This connection was made by cleaning the outside, then wrapping the strands of the conductor around it, and then enclosing the whole in a metallic clamp which was filled with molten lead and screwed up tight. An additional earth was made by means of a perforated wrought-iron pipe furnished with a steel shoe, which was sunk to the requisite depth to secure moist ground. The stranded conductor was dropped into the pipe, soldered to a lead cap on the top, and shielded from electrolytic action by wrapping it in a lead tube. The pipe has a bend at the upper end, projecting above the ground and closed by a plug so that water can be poured down. There are other earths of ordinary copper plate buried in a mixture of charcoal and broken electric light carbons, and the old system of conductors, as well as the new, is attached to all the new earths. It is also proposed to establish connection with the ends of the rain water pipes where they look out of the stone walls, down which all the conductors are laid.

Mr. Jos. H. Williamson, who for nearly eighteen years has been the business manager of the Manufacturers' Advertising Agency, New York City, has severed his relationship with that company to connect himself with the old established Viennot Advertising Agency, No. 524 Walnut street, Philadelphia, as its business manager. Mr. Williamson will be glad to welcome his many friends at any time at his new address, either at the office in Philadelphia or at the New York office of the Viennot Agency, No. 127 Duane street, Graham building.

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MANUFACTURES AND MATERIALS

SHINGLE STAINS.

70 KIRBY ST., BOSTON, MASS., OCT. 22, 1900.

EDITOR CANADIAN ARCHITECT AND BUILDER.

DEAR SIR,—We are glad to see your approving notice of the beauty and utility of stained shingle roofs, in editorial on page 186 of your October issue, but very sorry to see you giving the same approval to the hap-hazard stains that are made on the ground to suit each job. That part of the editorial tends distinctly toward the cheapening of building materials, to their injury.

We have been making shingle stains for nearly twenty years, having been the originator of this article, and as chemists who have made a study of the subject for all that time and longer, we have reason to believe ourselves more competent to speak upon it than any architect, however well equipped he may be in his own profession, or yourselves, whose ability in your profession is undoubted; because it is our profession and not yours.

For these twenty years we have tried to make an article which could not be improved upon for quality, and have guaranteed every gallon put out. We have used the most expensive and carefully selected pigments, ground them in our own mills, formulated them in our own laboratory, and compounded them in our own works; and yet the gentleman who penned the editorial in question appears to think that any painter, acting under the direction of any architect, can make a good enough shingle-stain by stirring color into a vehicle, without knowing with any accuracy what the color is, chemically, or whether the vehicle is one that will benefit the wood. Would he take the same position regarding paint, or varnish, or other materials?

We know from many analyses that these "mixed-on-the-job" stains are nine out of ten of them hap-hazard; with vehicles of kerosene or other worthless and inflammable petroleum product and pigments stirred in with a paddle without grinding. The use of these stains, by architects (and others) who do not realize that a true and good stain requires as much care and experience to make as a good paint, has given shingle-staining in general a doubtful reputation among the undiscriminating, and we dislike to see a journal of your standing giving encouragement to such things "on the ground of cheapness." Hoping that you will see the propriety of our protest, we remain

Yours truly,

SAMUEL CABOT.

[The portion of the article which referred to the use of "mixed-on-the-job" stains, was not an expression of opinion by the writer, but a statement of the opinion expressed to him by an architect.—EDITOR C. A. & B.]

MANUFACTURING NOTES.

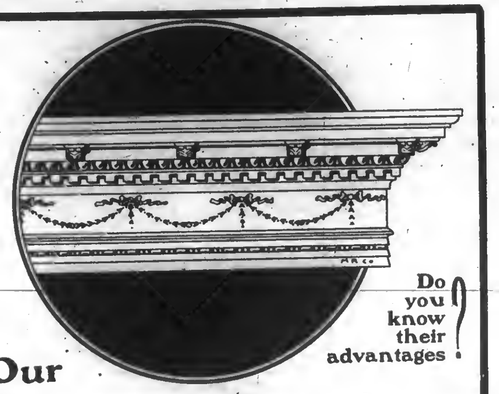
The Canadian Litholite Company, of Owen Sound, has been incorporated with a capital of $50,000.

A large deposit of clay suitable for the manufacture of paving bricks has recently been discovered at Wabigoon, Ont., and a brick manufactory will be established there.

Inducements in the form of a bonus of $2,000 and an excellent water privilege are being offered by the citizens of Tamworth to secure the removal of the cement works from Marlbank to that town.

A syndicate represented by Messrs. S. F. Mackenzie, G. H. French and J. Jeffries, has been organized to develop an extensive deposit of terra cotta and pottery clay on Salt Spring Island, near Vancouver, B.C.

Application for incoporation has been made by the Imperial Sand, Brick and Stone Company, with a capital stock of $200,000. The company controls a valuable manufacturing patent process. The head office of the company will be in Toronto. Mr. Chas. D. Warren, president of the Trader's Bank, will be president and managing director.



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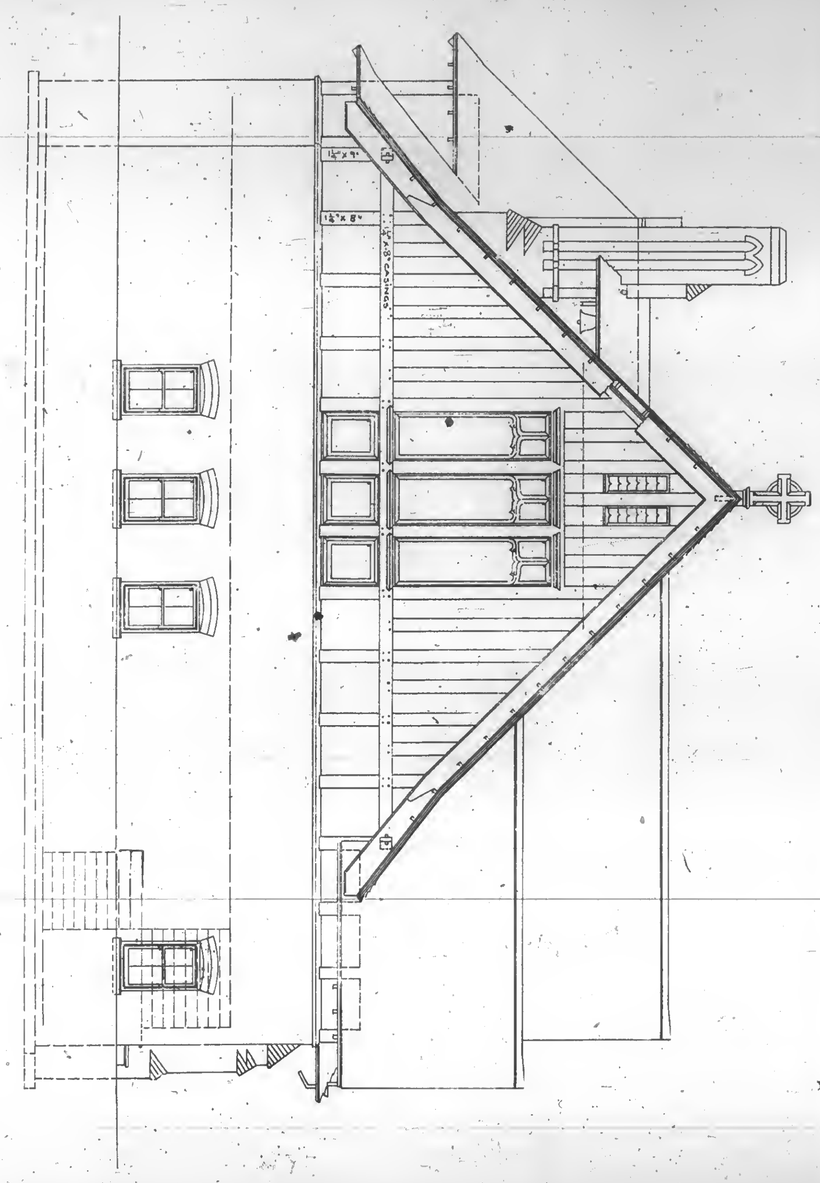

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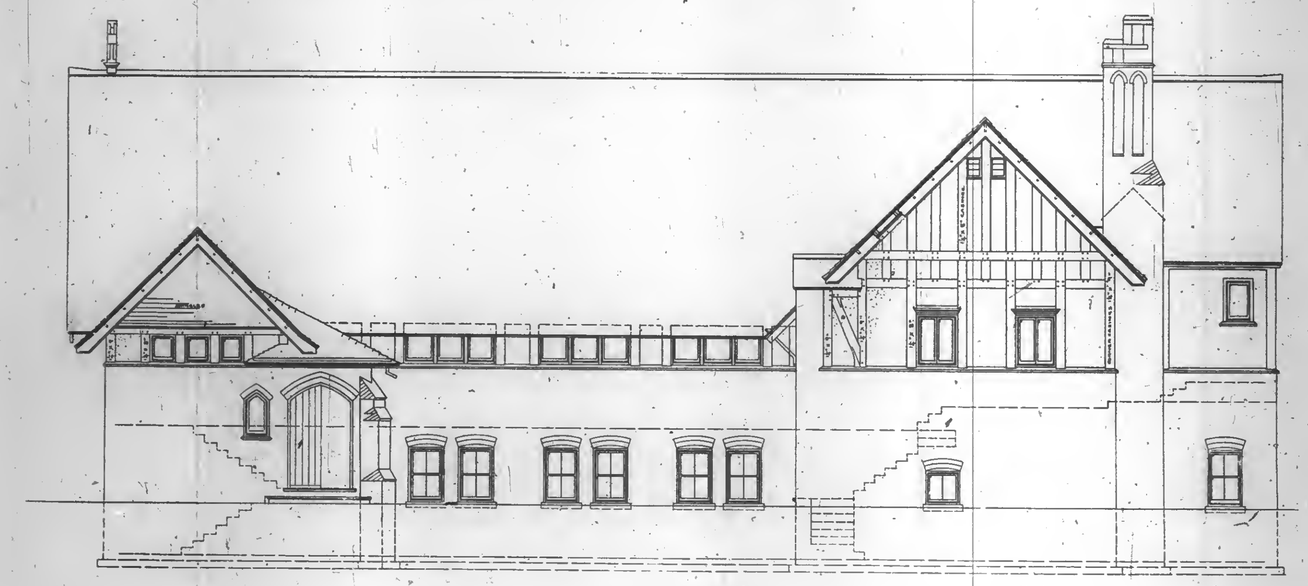

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EDITOR'S ANNOUNCEMENTS.

Contributions of value to the persons in whose interest this journal is published are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

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ANNOUNCEMENT.

The publishers of the CANADIAN ARCHITECT AND BUILDER have decided in future to issue two editions of the journal, one to be known as the "Architects' Edition," the other as the "Builders' Edition." The former will be artistic in appearance, and the character of matter and illustrations will be specially adapted to the requirements of architects. The price of this edition will be $3.00 per year. A large number of architects throughout the Dominion, whose advice has been asked, have signified their cordial approval of this change, and their willingness to pay the increased price. It is proposed to exercise the greatest possible care in the selection of illustrations for this edition, and to use the most expensive and effective methods of reproduction. In addition to examples of the best work of Canadian architects, there will be published in each number one or more illustrations of foreign work. Thus, Canadian architects who may not be in a position to subscribe for a number of architectural publications, will be kept in touch with the efforts of the most skilled architects of the United States and Europe.

The Builders' Edition will contain matter of a practical character to meet the requirements of persons engaged in the various building trades. Much of this matter will be illustrated in a manner to clearly explain what are believed to be the best methods of carrying out various kinds of work.

It is believed that by this change the publishers will be able to meet, in a manner more satisfactory than in the past, the requirements of both classes of

readers, and that, as a result, a larger number of subscribers will be secured.

The publication of the journal in two editions will begin with the January number.

A series of valuable articles has been secured for publication next year, which includes the following: "The Best Means of Reducing the Fire Loss in Buildings," by Edmund Burke, architect, Toronto; "Landscape Architecture," by Frederick G. Todd, Landscape Architect, Westmount, Montreal; "Planning," by S.H. Townsend, architect, Toronto; "Electrical Work as Applied to Buildings," by R. A. L. Gray, Electrical Engineer, Toronto; "Architectural Education for Canadian Students of Architecture," by Professor S. H. Capper, of the Department of Architecture, McGill University, Montreal; "Design," by J. C. B. Horwood, architect, Toronto; "Decoration and Furnishing," by W. H. Elliott, Toronto.

The authors of this series of articles have been selected with a view to their special knowledge of the subjects on which they will write. The subjects have also been carefully chosen with the object of furnishing a variety of matter calculated to interest and instruct all classes of our readers.

Other valuable articles will be published throughout the year, and every effort will be made to enhance the value of the CANADIAN ARCHITECT AND BUILDER to its readers.

Students' and Draughtsmen's Competitions.

THE attention of Canadian architectural students is again directed to the Students' and Draughtmen's competitions, particulars of which are printed in the Students' Department of this issue. These competitions are organized for the purpose of developing students' and draughtmen's knowledge of drawing and design, thus fitting them for the successful practice of their profession in years to come. It is earnestly hoped that students will show their appreciation of the object of these competitions, and encourage their continuance by participating in them to a larger extent than heretofore. Architects are requested to bring the competitions to the notice of their students and draughtsmen and encourage them to enter.

Manual Training

REFERENCE has been made on more than one occasion to the opposition manifested by the Trades and Labor Council of Toronto to the introduction of manual training in the public schools. We have never been able to understand why the representatives of skilled labor should oppose a movement which is so manifestly calculated to confer benefit upon their children. It is perhaps fair to assume that in the majority of cases the ranks of mechanics are replenished by the children of mechanics. How can it be an injury to the parents of these children that their offspring should have the opportunity in the public schools to obtain a knowledge of the use of tools and the theory of mechanics? If there is any benefit whatever to be gained from educating the eye and hand of the child, surely it is the working class who will receive the larger advantage. There has been a well founded objection made that the course of education in the public schools of Canada in the past was calculated to develop clerks and professional men rather than mechanics. Now, when a well thought out plan of manual training in the schools is put in operation through the philanthropy of Mr. W. C. McDonald, we have the spectacle of the Trades and Labor Council resolving to establish a labor paper with the principal object of opposing the progress of the movement. Could anything be more shortsighted and inconsistent?

Effect of Storms on Building Construction.

THE devastation wrought at Galveston, Texas, by a cyclonic storm, affords opportunity for investigation of the character of construction best adapted to withstand extreme wind pressures. It is understood that some buildings withstood the storm. Thus the means of enquiry is at hand, and it is to be hoped that some data on this important subject will be recorded. In Canada we have had no storms approaching in velocity the one in Galveston, but of late years, as the protection afforded by the forests has gradually been diminished, our buildings have been subjected to greater wind pressures than before. Within the last month we have experienced storms in which the wind travelled at the rate of 50 miles per hour. It is proof of the substantial construction of our buildings that so few chimneys and other projecting features were dislocated. The subject of wind pressure, however, is one which should receive greater attention in the future.

Canadian Soldiers' Memorials.

REFERRING to the article and correspondence which appeared in our last issue on this subject, the objection has been made that an arch would not constitute a fitting memorial. The argument is advanced that an arch is an emblem of victory and hence is not suitable for the purpose of a memorial. This objection, which comes from a source entitling it to consideration, appears to be well taken. Probably a group of statuary would best meet the requirements. Apart from the objection which has been mentioned, a permanent arch, if executed in a creditable manner, would probably cost a larger sum than could be raised by public subscription. Owing to the absence of public squares in the heart of the city, and the arrangement of the streets at right angles to each other, if would be difficult to obtain an entirely suitable site for an arch. If the city council had purchased and fitted up as a public square the piece of land opposite the new municipal buildings, as suggested two or three years ago, this would have afforded a suitable location. We do not know whether the land is still available, but unfortunately there appears to be no disposition on the part of the city council to make the purchase. When considering the question of cost and the probable amount which could be raised for a memorial, we are reminded of the difficulties experienced by those who have in the past undertaken to raise funds for a like purpose. It is not altogether surprising that in a new country such as Canada, large subscriptions should not be forthcoming, when even a wealthy nation like the United States will not contribute largely for such an object. The failure to obtain the necessary funds for the proposed Dewey arch is a case in point. Seemingly the only means by which a really creditable memorial can be erected is by Government funds. It would be a perfectly proper thing for the Dominion Government to make an appropriation for a National memorial to be erected at Ottawa, and for the Provincial Governments to appropriate money which might be added to by public subscription for suitable memorials for the vario

Provinces. It is desirable that early action be taken in this direction.

Competition for Exhibition Buildings.

THE Toronto Industrial Exhibition Association have sent out a circular inviting architects to submit competitive designs for a new main building and several subsidiary buildings to be erected on the exhibition grounds to meet the requirements of the proposed Dominion exhibition next year. The cost of the main building is estimated at $106,000, and of the lesser buildings from $5,000 to $15,000 each. To the author of the accepted design for the main building a prize of $250 is offered, and to the authors of the accepted designs for the smaller buildings prizes of $40 and $50. Architects are required to submit plans, elevations, perspective, and a brief specification — practically a set of working drawings. The prizes are totally inadequate in view of the requirements, and would barely cover the cost of preliminary sketches. The Exhibition Association should be aware that the best architects will not enter a competition on such terms, and therefore any designs which they may receive will be the work of the less skilful designers. Had the first prize been in proportion to the other prizes, it would have amounted to $1,000, which would have been a very modest sum. If new buildings are to be erected on the exhibition grounds—and few will deny that there is need for something better than the existing ones — the aim should be to put up structures of artistic appearance and perfectly adapted to the requirements. The individual buildings should not only be well designed, but the several buildings should be so arranged and designed that when constructed they will present a harmonious and pleasing effect. This result can only be accomplished by having some skilful architect lay out the general arrangement, and control, to some extent, the character of the designs. It will be remembered that this was the method pursued when the Chicago exhibition buildings were erected, and it was entirely justified by the result. It would be wise for the Association to place the designing of the smaller buildings in the hands of the architect whose design may be accepted for the main building, or if the various buildings are to be designed by different architects, then there should be consultation between them regarding the general arrangement of the buildings and the character of the designs. Unfortunately the competition has not been framed on proper lines, and it is hopeless to look for a satisfactory outcome. Even with the meagre prizes offered, a better result might have been secured if more time had been allowed the competitors. The one satisfactory feature of the competition is the fact that as the result of representations made by the president and members of the Ontario Association of Architects, it has been decided to have the plans which may be submitted judged by experts to be appointed by that body.

The Application of Color to Architecture.

THE subject of the application of color to architecture is one which has often times been discussed. An experiment in this direction is now to be made in connection with the buildings in course of construction for the proposed Pan-American Exhibition at Buffalo, New York. These buildings, like those at the Chicago and Paris exhibitions, will be constructed of steel and covered with staff. It has been decided to color the exterior of the buildings. The work is to be done under the direction of Mr. C. Y. Turner, of New York, who is said to have worked out a color scheme which promises to give a satisfactory effect. The predominating colors will be ivory tints for the walls, with decorations in delicate shades of blue and green. All projecting features, such as domes and minarets, will be gilded. The buildings, which are strongly Spanish in design, are roofed with metal stamped to represent Spanish tiles, and painted a dull rich red. The effect of these metal roofs is all that could be desired, notwithstanding that the metal is extremely thin, and would not stand the action of the weather for a much longer time than the period over which the exhibition will extend. In order to secure the desired color effect, small models of the principal buildings have been prepared. These are placed on a platform, laid out to scale, representing the exhibition grounds. The wall spaces on these models are covered with strips of paper painted to the desired shade of color. We presume that the coloring matter will be applied, as at Chicago, by means of a spraying apparatus. The result of this experiment will be watched with interest by architects. It does not seem probable, however, that it will have any decided influence in encouraging the use of color to a greater extent than at present on buildings of a permanent character. Even in the favorable climate of Italy, color is not applied to the exterior of buildings, except in a few instances where colored mosaic is used. The application of color to a stone building, for example, would be entirely out of place, and would greatly detract from the dignity of the structure. This has even been the effect where stone of two or more shades of color has been employed in the construction of monumental buildings. In domestic architecture, however, color is being employed to a greater extent than formerly, and when judiciously used often adds to the beauty and interest of the building. Special training and care are, however, necessary on the part of the architect to secure this result.

ONTARIO ASSOCIATION OF ARCHITECTS.

Preparations for the annual meeting in January are in progress. Several interesting papers have been promised. The suggestion has been made that the meeting should be made coterminous with the Exhibition of architectural drawings by the Toronto Architectural Eighteen Club. An added inducement would thereby be offered to architects outside of Toronto to participate in the proceedings. The Association's new rooms, which by that date will be completely furnished, should also be a source of attraction to outside members. It is understood that an agreement has been reached between the association and the Toronto Architectural Eighteen Club, by which the latter organization will enter the Association as a body. This accession to its membership from the ranks of the younger men in the profession, should greatly benefit and strengthen the association.

QUESTIONS AND ANSWERS.

Would you kindly give us a price per yard for blasting and taking out of ordinary granite rock out of pit say 12 feet deep and 12 feet wide, also price for surface blasting.

Answer—We estimate that the cost of blasting and taking out granite rock from a pit 12 feet deep and 12 feet wide would run from $3.50 to $4 per yard, and the price for surface blasting from $2.75 to $3 per yard, according to the nature of the material.

A BRIEF HISTORY OF THE SCHOOL OF PRACTICAL SCIENCE.

THE banquet to be tendered on the 21st inst. to Professor Galbraith, principal of the School of Practical Science, Toronto, by the faculty, graduates, and undergraduates, has naturally carried the thoughts of many back to the early days of the school, as almost since its inception the name of Professor Galbraith has been regarded as synonymous with the success of the school. Established in a modest way to meet the demands for technical and scientific education, the growth of the institution has been almost phenomenal, until the increased accommodation provided from time to time is now entirely inadequate.

The present School of Practical Science is the successor of the College of Technology, an institution which was practically an evening technical school for artisans and others, and which occupied the building of the present public library, at Church and Adelaide streets. The origin of the present school dates from January 30, 1877, when the Legislative Assembly, in accordance with the recommendations of a report to the Hon. Adam Crooks, Minister of Education, by Professor James Loudon, sanctioned the proposal for the permanent establishment of a School of Science, and authorized the erection of a new building upon a site in proximity to the University of Toronto. The character of the institution was greatly changed, and under the new arrangement the chief object of the school became the teaching of engineering and applied chemistry. It was decided by an arrangement with the Council of University College, to utilize the teaching power of that college which already existed for the like objects in four departments and could be made applicable to the wants of the School of Science, and in addition thereto to appoint a professor of engineering and such assistants as might be found necessary. This arrangement continued until the end of 1879, when the departments of science were transferred from University College to the University of Toronto, under the operation of the University Federation Act. That the students might continue to receive instruction in the above departments in the same manner, the School of Science was affiliated with the University of Toronto.

PROF. GALBRAITH,
Principal School of Practical Science, Toronto.

The building erected at that time forms the north wing of the present school. Besides being the home of the engineering classes, it furnished accommodation for the departments of biology, chemistry, and mineralogy of the University, the engineering department having but one floor.

The first calendar of the School of Practical Science is denoted as the session of 1878-79, and the faculty consisted of H. H. Croft, D.C.L., professor of chemistry; E. J. Chapman, Ph.D., L.L.D., professor of mineralogy and geology; James Loudon, M.A., professor of mathematics and natural philosophy; R. Ramsay Wright, M.A., B.Sc., professor of biology; J. Galbraith, M.A., Assoc. Inst. C.E., professor of engineering; W. H. Ellis, M.A., M.B., assistant professor of chemistry. The attendance at the school in this year was six students.

From the calendar we notice that there were three courses, namely: (1) engineering; (2) assaying and mining geology; (3) analytical and applied chemistay. Regarding the engineering course, it is stated that in the absence of a machine shop visits to workshops and excursions during the long vacation will be taken advantage of.

An important event in the history of the school occurred on November 6th, 1889, when Professor Galbraith was appointed principal and the management of the school entrusted to a council composed of the principal as chairman and the professors, lecturers, and demonstrators appointed on the teaching faculty of the school. Recognizing the necessity of embracing every branch of applied science, the principal decided to extend the curriculum of the school so as to embrace five regular departments of instruction, in each of which diplomas would be granted, namely, (1) civil engineering (including mining engineering); (2) mechanical engineering (including electrical engineering); (3) architecture; (4) analytical and applied chemistry; (5) assaying and mining geology.

In 1889-90 the management of the school was entrusted to a council of five, consisting of Professors Galbraith and Ellis, and Messrs. C. H. C. Wright, B.A. Sc., lecturer in architecture; T. R. Rosebrugh, M.A., demonstrator in engineering; and L. D. Stewart, O.L.S., D.T.S., lecturer in surveying, with Professor Galbraith as principal. These five are still members of the council, which has been enlarged to include A. P. Coleman, M.A., P.L.D., professor of assaying and metallurgy; J.A. Duff, B.A., lecturer in applied mechanics; G. R. Mickle, B.A., lecturer in mining, R. W. Angus, B.A.Sc., lecturer in mechanical engineering; A. T. Laing, B.A.Sc., demonstrator in surveying; and J. W. Bain, B.A.Sc., demonstrator in analytical chemistry. In addition six Fellows have been appointed from among the late graduates.

As early as 1888 the necessity of providing increased accommodation was recognized by the Government, and an appropriation made for the erection of a large addition to the building. This addition was completed in 1891, the equipment and the laboratory plant installed being of the best then procurable. The building as now occupied represents a floor space of nearly 60,000 square feet, but, notwithstanding, the accommodation is overtaxed, and the work of the teachers made laborious by the necessity of repeating lectures and laboratory experiments three or four times in order that all students may receive the instruction. It has also been found necessary, from the same cause, to abandon certain experimental and research work.

That the School of Practical Science is meeting the demands of the people is clearly demonstrated by the almost constant growth in attendance. The present year is the largest yet on record, the attendance being about 220.

It is interesting to learn that the graduates of the School of Practical Science are finding employment in connection with the development of the natural resources of the country, and that many of them are now occupying responsible positions. A glance at the calendar shows that of the 263 living graduates of the school, about 75 per cent. are employed in Canada, while the remaining 25 per cent. are scattered over other parts of the world.

PROFESSOR GALBRAITH.

The head of this admirable institution, Professor John Galbraith, is a son of the late Thomas Galbraith, of Port Hope, well known to every Scotchman in Canada as the Canadian agent of the "Scottish American." He was born in Montreal on September 5th, 1846, and educated at the Port Hope Grammar School and Toronto University. At the latter he took several scholarships in mathematics and general proficiency, and graduated in 1868 with the degree of B.A., securing the gold medal in mathematics and the Prince of Wales' prize for general proficiency. In 1875 he was granted the degree of M.A. He studied engineering under Mr. George A. Stewart, chief engineer of the Midland Railway, and was admitted as a Provincial Land Surveyor. He was employed for some ten years in railway construction work on the Intercolonial Railway, the Midland Railway, location of the Georgian Bay branch road, and exploratory surveys for the C.P.R. He was also employed for some time in the Portland Co.'s locomotive shops at Portland, Maine, U.S., and did consulting work in hydraulic engineering, receiving the appointment to the chair of engineering in the School of Science in the fall of 1878.

Professor Galbraith was one of the founders of the Canadian Society of Civil Engineers, serving for five years on the council of that body. He is also an associate member of the Institute of Civil Engineers of London, England.

As Principal of the School of Science, Professor Galbraith has labored zealously, and to him is due much of the credit for the high degree of efficiency which has been attained. At the outset he had an object in view. This was to fit the student for active professional work by giving him a thorough training in scientific principles rather than by attempting to give him a so-called practical training. It is along this line that the efforts of the school have been concentrated, and the wisdom of such a policy seems to be borne out by the results. If one were to enquire from any of the co-workers as to the secret of Professor Galbraith's success, the reply would probably be that it was due to his great qualifications in the direction of organizing the work at the school. As remarked by an intimate acquaintance, "he is a wonderful organizer."

After having completed his 21st year as head of the school, the proposed banquet to be tendered him is a fitting tribute of respect.

Geo. Bathy, of Wallace, N. S., is erecting a large brick factory in conjunction with his quarries. Formerly quite a depth of clay has had to be removed in order to reach the stone and this has been a serious drawback. The removal of this clay, which is fine material for brick manufacture, will result in stripping stone.

SOURCES OF ORNAMENTATION.

By FRED T. HODGSON, MEMBER O. A. A.

BEFORE proceeding with this essay, it may not be out of place to ask of ourselves, what is meant by ornament? Ornament, I should say is any design which may be added to any object with a view of making that object more beautiful or more interesting, but which would not be of special interest by itself. Ornament, then, is something introduced to give interest to an object other than it would possess without it. It is very important then, to bear in mind that the interest of ornament is, on this account, relative, and not absolute, because upon that consideration depends the truth of the views we may take regarding the proper adaptation of ornament. If we looked through the various classes of ornament, we should find that there were two divisions into which they are merged in regard to their application—that is, they were employed either to diversify or give interest to a surface otherwise uninteresting, or that they were applied to emphasize some part of the object ornamented—and especially to emphasize function and to draw attention to the most important part or parts of the object. The first named class might be distinguished as "surface ornament," the latter as "functional ornament," or ornaments raised above the surface, or in relief.

The poet Keats has beautifully told us, that "a thing of beauty is a joy forever," a trueism every intelligent being will accept without argument, but, we are compelled at this point, to propound another query, and ask "What is beauty?" A confessed difficulty lies at the very threshold of such an inquiry. We are at once confronted by an appeal to individual taste. A Chinese or even a Japanese will acknowledge no overpowering emotion in the presence of the noblest relics of Grecian antiquity—the Venus of Melos, the Cupid of the Vatican, or the Psyche of the Museo Barbonico. But he will rave about "golden lillies," or a mutilated doll, with slanting eyes and a pimple instead of a nose. Therefore, we may be told, the emotion, amounting in some instances almost to physical pain, that stirs the cultured individual on a sudden glance at the grandest relics of the Phidian age, is conventional. It is only the product of his education. The Venus of Milo is a bit of marble; and a huge bronze Kylin—an embodiment of all that man can pile together of the terrible—might stir the same emotion in us, if we had been differently trained from infancy. In arguments such as these there is enough of truth to constitute a respectable fallacy. In all phenomena that affect mankind we have to consider the external as well as the internal action. The objective, if it have any independent existence, cannot be conceived independently by the human mind. Subjective and objective are as inseparable as convex and concave or vice and virtue; the one is necessary to the other. If we speak of any phenomenal action, we have to imply the mode in which that action affects the human organization. Light is to us nothing but an abstract and most puzzling term, apart from our daily optical experience. Music is divine language to the person blessed with a musical ear; while it is an unknown tongue, or simply a noise, to a very large proportion of mankind which is destitute of that native faculty. And therefore, with regard to beauty, which we may regard as the visible expression of the highest excellence, any appreciation of its lustre must depend on the

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An essay read before the Fortnightly Club, Collingwood, Ont., Nov. 21st, 1900.

mind in which the emotion is raised almost as much as in the object which raises the emotion. Beauty, then, is something that can not well be formulated, so as to meet the ideals of all people, though we may in a measure set up a standard—an elastic one—that will appeal to the emotions of an Aryan people, but, even then, we shall find tribes and local lines which mark a certain demarcation of taste. No doubt, on the other hand, there are principles which are of more universal application. The negro represents the devil as white; but, the negroes as a rule, admire the white man rather than the black or the dusky; even as the latter admires the white woman rather than the black. Homer clothed his immortals in robes of light, goodness and purity, and thus gave to them a beauty that reached beyond the confines of human imagination, or even of human worship, and so it is that the aspiring artist must ever hunger after a beauty that no chisel and no pencil can represent.

Nature is to be considered merely the germ of ornamental art; art must develop nature's suggestions, combine her forms and, besides pleasing the eye, subserve a purpose. Forms and colors seem in nature to excite admiration of a different kind from that involved by the productions of artists. The latter must please the eye, gratify the taste, and exhibit fitness for its special intention. The art of the past, that aggregation of experience derived from the application of the suggestive hints of nature is simply a means of study to the ornamentists, an aid to the mastery of principles and rules. The range and variety of illustrations to be found in nature represent every principle on which beauty depends; its study supplies a fertility of resource, even as regards construction, as well as the harmonious arrangement of parts, the ornamentation of those parts, and as to the degree of prominence which decoration should assume. But it is in decoration setting forth the special qualities of the artistic mind, confirming what is material to a designed purpose, expressing the perception and feeling of beauty and truth in the designer, that its great interest lies.

In designing the decorator has to take into account two kinds of expression, the one definite and certain, the other conventional and capricious, the former dependent on natural principles, the latter upon association. The force of association was illustrated when in France, archaic severity in ornament, at a period when republicanism had triumphed, was regarded as "the thing," and decorations assumed a funereal aspect. In projecting ornamental designs, as in realizing this effect, mental impressions have to be taken into account in artistic rendering. Thus, in form, angular expresses strength and durability; the curvilinear, softness, delicacy and fragility.

Definite forms may be classed as the rectilinear and rectangular, the rectilinear, but oblique angled, curvilinear forms without contrary flexures, curvilinear forms with geometrical contrary flexure, and curvilinear forms with contrary natural flexure. The discovery of the means by which the expression is given to them involves an extensive process of comparison. Often their conjunction and admixture have merely the significance that attaches to playfulness and delicacy.

The adoption of ornamental treatment suitable to a material has a decisive influence on design, as in gold in sheets—beaten, raised in lobes, fluted to give strength and shadow; in wire—as in coiled, spiral, and numberless curved forms. Stone has its natural expression in masses, chambers, etc. This condition does not exclude one material taking designs proper to another. Foliage should perform no office other than ornamental, such as adding richness and variety, filling out forms and covering junctions, as in metal work. Hence the impropriety of using floral designs for brackets or bosses that are supposed to require strength and stability.

The Persians, in seeking to produce masses of brilliant and variegated color without offensive gaudiness, betook themselves to mosaics for the adornment of their walls and the exterior of their mosques, showing magnificent incrustations glistening in vitreous glaze. The radiant hues being natural, the colors and tints of real stone could not offend the sight; there was a certain sobriety even in the splendor of surface. Beautifully veined and naturally tinted woods have a charm independent of the design into which they enter, whilst the design, taking them into account, is also enhanced in its effects.

The character of material used for decorative purposes necessarily affects the essential features of the ornament. Lustrous, or dead surfaces, hues, or intrinsic qualities, are themselves constantly suggestive of new devices and effects. Mechanical operations and chemistry, brought to the preparation of materials, wondertully augment the resources of the ornamentist. Both the art and science are illustrated in enamels, which, having for their base hard, resistive substances that are ground to an impalpable powder, and blended with cohesive elements, are rendered plastic and absorptive of color, finally being fired, so placing an essentially perishable colored design beyond the reach of change.

There are mysterious properties in colors that serve the purpose of the ornamentist, and suggest various departures in design that result in excellent effects without apparent rule. The eye, for instance, possesses the power to supply the complementary color of the hue on which it rests.

A celebrated French painter remarked that "every bed of violets was surrounded with a halo of purple." Again, whatever the laws that regulate color—and theories and deductions on this point differ—their aesthetic value or influence on the sentiments must be taken into account for satisfactory treatment.

A reed, a flower, a broken stem, what significance may not attach to them when elevated to decoration? as the reed in the flutings of Corinthian columns, the flower in moulded form or beaten metal as a symbol or emblem, like the lotus of Egypt, the broken stem setting off curvilinear lines in capital or in the mouldings of a cornice, a band or frieze on a vase, or on a panel in simulated carelessness of rendering?

To what are we to ascribe the simply perfect use of color by the Orientals? Whether they use the brightest or most subdued tones, it makes no difference, the patterns are harmonious and gratifying. They value the color only as it assists the purpose of design. As all pleasing effects obtained in decorative art are referable to the conjoined or separate expression of the laws of harmony and contrast, it would seem as though by some latent principle of mind, or passive reception of the subtle teachings of nature, they had unconsciously acquired their marvelous aptitude to treat color, not only appropriately, but so as to secure the best results. It is the same with their pottery, their enamels, their silk stuffs, and their tapestry and embroideries, executed with surprising manual rapidity,

and often without a formal pattern, and not merely in color. Whether by instinct or tradition they have marvelous appreciation of true form and proportion.

A man aided by a child constructs a gigantic jar as we build a house with no other instrument than the hands and a spatula; an amphora of extreme height, and presenting beautiful corners, is produced. On the borders of the Nile females with their children make alkarazas so eloquent in form as not to need the aid of color to command admiration. With orientals the sense of the beautiful shows itself in all things.

Flat ornament is the most natural and obvious means of decorating solid surfaces, and this in conventional form. The source of this appropriateness is to be found to reside, so to speak, in the moulding or carvings of natural forms as something simply imitative, and, therefore, with all the labor and ingenuity exercised of no high order of art, and therefore not conforming to an imposing position.

In many branches of art the designs are drawn direct from nature. The designers of textile fabrics may be seen with a group of flowers freshly gathered from a garden in small vases before them arranged so as to present some novel or pleasing effects which are transferred in modified form to their patterns. The same colors or precisely the same forms may not be reproduced, but the flowers and the portion of the group dealt with are artistically wrought out.

Sometimes the flowers that serve as models for decorative metal work are pressed between boards so as to present an aspect to some extent conventionalized for treatment in his bas relief. This method of securing the original of patterns has for ages been adopted in the east, and serves to account for some of the really exquisite transformations that we witness.

Many forms of the ornamental class are not naturally supplied. Such is the Greek fret series of squares, one within another, interior lines being brought up at intervals, thus getting rid of the mere square. Arabic decoration, though very ornamental at first sight, was in reality based on extremely simple combinations. Celtic art with its mystic interwoven strap-work and grotesque monsters is chiefly formed of the higher geometrical curves and right lines, and is perhaps, the most difficult to analyze. Natural forms unless distorted, are seldom introduced in Celtic art.

It is a curious fact, that some of the choicest patterns of apparently eastern origin, of the eastern carpets, have been reproduced from the paintings of old Flemish masters—Van Eyck—Memling, and others, and the Florentine artists, such as Shirlandage and Montegna. So also with hangings, table covers and other similar products. Some of these painters simply give divisions of color and main outline of the patterns, and in place of angles substitute curves; others, like Holbein, delineate even the very stitches.

In a design of varied character the desirability of introducing a few points of resemblance between the forms, thus establishing certain affinities, provides a contribution to decoration. The securing appropriateness in the ornamentation is another requirement that has its influence in fashioning ornament. The ox heads and festooned garlands carved on the friezes of Roman temples had a practical value as betokening sacrifice, whilst in other public buildings they would have been stupid and vulgar.

Consonance of agreement with the general design is a prime element of good ornament, and it is just because this consonance is not found in ornamentation of a different purpose that the ornamentist finds so much in bygone art that cannot be utilized. The introduction of an opposing tone in colors to impart unity of effect, is a leading element in color design. The upholsterer who brings together two colors—say yellow curtains with green covered chairs—will wisely repeat the green in the curtain in a narrow strip, to harmonize with the chairs. Contrast usually involving alternation, some of the most beautiful effects of form are obtained through their connection. To the contrast of form and color decoration owes some of its happiest inspirations. A further source of beauty in ornament is derived from the prevalence of one quality in color, or of a given size of form over another.

It is noticeable that all that is lovely in landscape is produced by contrast of tone, not color—by the bright green of young shoots against the dark, sombre green of the older wood; by the gay birch with its bright leaves against the dark green pine, cedar or hemlock, and these against the deep blue sky as a background. The present advance of decorative art is largely due to more attention being paid to contrasts, and to their more skilful manipulation.

The circumstance that the mind never draws the line too close between use and ornament, has led to articles of vertu in the precious metals to the blending of both in structural forms, and with little conventionalism as regards ornament. An instance occurs to me in a silver standard consisting of a stalk with the leaves of a honeysuckle gently folded around the stalk at irregular intervals, and a flower here and there showing itself between the leaves. The richness of the material justified the labor and ingenuity expended upon it. Similarly, on vases of precious metals, nature, leaves, foliage, flowers and stems may be imitated as closely as one pleases in relief, or as undercut work, if only care be taken that it shall fill up a defined and bordered space.

In the Arabesque style of foliage and tracery there is a mild freedom which pleases the fancy, partly because no actual natural forms are portrayed, whilst yet they are suggested in the flowing outlines, in the lightness with which the ground is touched, and yet transformed in effect and the way in which the sight is lured to traverse over the whole surface. But as a means of decoration, Arabesque is to be used charily; it has indeed the charm of repetition, but where uniformity is equal the beauty of forms is in proportion to their variety. The harmony established is by analogy of size, color and form, but affinities may be carried too far. The true law of harmony is conformation and divergence.

The collected experience of artisans of the past constitutes a leading source of ornament. Carvings and mosiacs, figured tissues, stained glass, metal work, even paintings and architectural treatment of decoration supply a fund of artistic instruction, not for reproduction, but suggestive of new combinations.

The course of ornament, renewing at intervals of time features of previous periods, with new characteristics super-added, has its counterpart in seeds transplanted to new soils and climes, the change resulting in new developments that in some respects are wholly new. Thus, the growth of new features in the art of ornamentation is continuous and everlasting. One new design suggests another, and the chain lengthens and broadens as time advances, each race of mankind following that style of ornamentation that seems most suited to the peculiar qualities of its mental structure; indeed, it has been hinted that a man's liking for this or that style of ornament may be taken as an evidence that he descended from the Aryan, Semitic, Turanian or Celtic stock, according to the style he admires most.

STUDENTS' DEPARTMENT.

C. A. & B. STUDENTS' COMPETITIONS.

The publishers of the CANADIAN ARCHITECT AND BUILDER invite architectural students and draughtsmen resident in Canada to submit drawings in the following competitions:

STUDENTS' COMPETITION FOR A PORCH.

A plan, section and perspective sketch are required.

Explanatory detail sketches of certain portions may also be included.

The subject is an entrance porch to a city house of 35 feet frontage facing south or east on a 50 ft. lot. The porch to be large enough for use as a verandah, and yet not to cover all the front windows, as it is desirable to have the sunshine enter the parlor by at least one window.

The porch may be of wood, brick or stone or combinations thereof and may have flat or sloping roof.

STUDENTS' COMPETITION FOR ENTRANCE DOOR, VESTIBULE AND VESTIBULE DOOR.

A plan, and section are required and elevations of both doors.

Explanatory detail sketches of certain portions may also be included.

The subject is the entrance from the above mentioned porch. Light may be obtained for the vestibule from a window on one of the walls not occupied by the doors, or from the entrance door or wall in which the door is placed.

The vestibule must be large enough to accommodate a fair sized hat rack and an umbrella stand.

Drawings must be made with pen and perfectly black ink on white drawing paper or cardboard. No brush or color work will be allowed. Drawings should be so arranged as to admit of photographic reproduction in the illustration pages of the CANADIAN ARCHITECT AND BUILDER. The size of each page is 7x10 inches. No set of drawings must occupy more than two pages.

Competitors must send in their drawings, prepaid, under motto marked "Students' Competition," and addressed to "the publishers of the CANADIAN ARCHITECT AND BUILDER, Confederation Life Building, Toronto," prior to 5 o'clock p.m. of the dates set for the competition, viz; 1st competition, Thursday, 27th December, 1900; 2nd competition, Monday, January 28th, 1901. Each set of drawings must be accompanied by a sealed envelope bearing on the outside the author's motto and enclosing a card giving his full name and address.

The merits of the designs which may be submitted in in these competitions will be judged by a committee of the Ontario Association of Architects, whose decision shall be final. For the benefit of competitors, the judges will be requested to give a detailed criticism of each design.

Three prizes are offered in each competition as follows: To the winner of 1st position, $10; to the winner of 2nd position, $5; and to the winner of 3rd position, one year's subscription to the CANADIAN ARCHITECT AND BUILDER.

The right is reserved to publish any or all of the drawings.

NOTE—Competitors are required strictly to observe and comply with the above instructions and conditions.

TORONTO ARCHITECTURAL EIGHTEEN CLUB COMPETITION IN RENDERING FROM PHOTOGRAPH FOR STUDENTS.

The students must render in pen and ink only and to twice the size of cut.

The subject will be accompanying cut on Eighteen Club page of chapel in St. James cemetery, Toronto.

The paper to be white and to be 15" x 22"

The drawings will be judged by the members of the Eighteen Club.

There will two prizes, one of ten dollars for the best drawing submitted by students who have served for a period not exceeding five years, and one of five dollars for the best drawing submitted by students who have served for a period not exceeding three years to date of issue of December number of CANADIAN ARCHITECT AND BUILDER.

The drawings must be signed by author's name and must be accompanied by a letter stating length of service and signed by one of the firm in whose office the pupil is serving.

The best drawings in each class will be hung in the Eighteen Club's exhibition from Jan. 26th to Feb. 9th, 1901; and the best drawing submitted will be reproduced in illustrated catalogue and both prize and honorable mention drawings will be published in the CANADIAN ARCHITECT AND BUILDER.

Every competitor will receive a copy of the Toronto Architectural Eighteen Club's illustrated catalogue free.

Drawings must be delivered to or mailed so that they will reach Chas. D. Lennox, 71 Yonge street, Toronto, not later than noon on Saturday, Jan. 5th, 1901.

TORONTO GUILD OF CIVIC ART.

At the annual meeting held last week the following officers were elected:—President, E. F. B. Johnston, Q. C.; vice-presidents, Hon. Geo. W. Allan and A. J. Somerville; treasurer, James Bain, Jun.; secretary, A. H. Campbell. The following were appointed members of the Advisory Board:—Messrs. G. A. Reid, F. S. Challener, Allan Cassels, B. McEvoy, G. N. Morang and G. A. Howell.

By request of the Minister of Education a committee was appointed by the Guild early in the year to select the paintings annually purchased by the Provincial Government for the Normal school gallery.

The Municipal Committee of the Guild submitted to the Property Committee of the City Council a comprehensive plan of mural decoration for the City Hall and asked for a preliminary appropriation of $1,000 with which to begin the work. The Property Committee approved of the plan and of the work being done under the supervision of the Guild, but on the plea of lack of funds, the granting of an appropriation was deferred.

The Guild are trying to induce the Committee which has in hand the erection of the proposed Simcoe memorial to invite sculptors to submit designs in competition.

ILLUSTRATIONS.

GOLF CLUB HOUSE, TORONTO.—CHADWICK & BECKETT, ARCHITECTS.

RESIDENCE OF MR. BEAUMONT JARVIS, ROSEDALE, TORONTO.—BEAUMONT JARVIS, ARCHITECT.

M'DONALD ENGINEERING BUILDING, M'GILL UNIVERSITY, MONTREAL.—ANDREW T. TAYLOR, F.R.I.B.A., ARCHITECT.

CHAPEL IN ST. JAMES'S CEMETERY, TORONTO—SUBJECT FOR RENDERING IN TORONTO ARCHITECTURAL EIGHTEEN CLUB'S STUDENTS' COMPETITION.

ILLUSTRATIONS ACCOMPANYING PROFESSOR SQUAIR'S LECTURE ON "CHURCH ARCHITECTURE IN NORTHERN FRANCE."

COLLEGE RESIDENCE AT SACKVILLE, N.B.

THE accompanying plate illustrates the handsome brown stone residence recently completed in Sackville, N.B., in connection with the college there. The main building is four stories, size 217 x 50 feet, with a rear ell, 90 x 45 feet, and was designed by Messrs. Burke & Horwood, of Toronto. It replaces the residence which was burned last year.

The students' rooms are bright, airy and commodious, and present alternating systems of rooms in pairs (study and bedroom for two), with apartments for single occupancy. The large hall in the ell is a handsome room having an open truss roof with exposed timbers, and ornamented windows.

The building contains spacious and sunny dining room, well lighted reading rooms, large office and reception rooms, Y. M. C. A. rooms and rooms set apart for hospital uses.

A large reservoir in one of the towers provides protection from fire. Drainage, plumbing and ventilation appear to have received particular attention.

COLLEGE RESIDENCE AT SACKVILLE, N. B.—BURKE & HORWOOD, ARCHITECTS.

MEMBERSHIP IN THE O. A. A.

THE attention of the architects of Ontario who are not members of the Ontario Association of Architects is called to the fact that as was proposed at the last annual meeting a special arrangement was made to admit members during the year by passing the following resolution:

"Whereas the Association is endeavoring, during the current year, to establish conditions of new activity and usefulness, and certain architects are in consequence desirous of becoming members of the Association without passing the examinations prescribed for students, be it therefore resolved that: Architects who have not registered, nor passed the examinations prescribed by the Association, but who otherwise satisfy the requirements of the "Ontario Architects' Act," and who apply before December 31st, 1900, may be admitted without passing the examinations prescribed for students, if the Council after taking such steps as may be necessary to satisfy themselves of the qualifications of applicants, are agreed as to their fitness."

This resolution was published in this journal in August and some desirable men have been added to the roll of membership, and it is the desire of the Council that further applications shall be made immediately as the opportunity ceases this month. Application should be made by sending name to the registrar, W. R. Gregg, 94 King street west, Toronto, who will bring it before the Council.

SWEDISH BRICKWORK.

SWEDEN is a country of forests, and until recently, says the British Clayworker, the domestic buildings were constructed almost entirely of wood. Time after time, however, the towns have been laid waste by fire, and from the ashes there are now rising towns of brick and stucco. The bricks are usually larger than those employed in this country, measuring about 12 in. by 6 in. by 3 in., but the size varies in different districts. For exposed brickwork, header bond is generally adopted, the angles being formed with three-quarter bricks laid alternately along each return. At Upsala Cathedral, however—which, by the way, has been restored till it looks as if it were built yesterday instead of five hundred years ago—the bond is somewhat curious, and varies in different parts of the building. Most of it is a modification of the so-called Flemish bond, and consists of two stretchers followed by a header. The effect is far from displeasing. A few modern buildings in Stockholm are faced with rock-faced wall stones, shading in color from yellowish-brown to purple. The courses vary in depth and in width of bed, so as to bond with the brickwork behind.

BRITISH COLUMBIA LETTERS.

No. IV.

PROBABLY the most important event that has yet taken place in the provincial world of art is the first annual exhibition of the Arts and Crafts Association which was held in Vancouver at the Alhambra Hall on 24th, 25th and 26th of Sept. In the absence of the association's patron, His Excellency the Governor General, the exhibition was declared open to the public by the Mayor. Several hundred visitors were admitted during the period mentioned. Somewhat more than three hundred exhibits were catalogued, and of this number far too great a proportion belonged to pictorial art; architecture, design, furniture, carving and so forth were all too thinly represented, but some exceptionally good collections of photographs, several good examples of pyrography, of stained and painted glass and embroidery and some really excellent painted china invested the crafts section with considerable interest.

Dealing with the subjects in catalogue order: the first screen was devoted to the work in oils of Mrs. Marcus Lucas whose clever sketches in the impressionist school deserved much of the favorable comment made on them; a small low-toned picture of Botany Bay, N. S. W., and a delightfully hazy morning in Burrards Inlet being perhaps the best of this member's exhibits. W. M. Forrest's amazing industry is proved by a vast amount of work. We think he would do himself greater justice if he devoted his capacity for downright hard labor to a more sympathetic treatment than to such prolific production in a somewhat stereotyped manner; his technique is too hurried and there is frequently a photographic effect noticeable; the color and motion of water is happily caught in several sketches. W. Ferris, who is another great worker, contributed many pretty subjects, nearly always well chosen, but not so frequently pleasing in color, which is too dense, particularly in the forest shades. Mrs. Watertall's study of still life was in many respects excellent and we shall expect to see a marked all round improvement in this lady's work; the other exhibits in oil were mostly very amateurish, and in too many instances were merely copies of no great promise.

Of the water colors, it was generally conceded that Mr. T. W. Fripp's drawings simply stood alone, being the only work which may be said to be really representative of the genuine old school of water color painting and following the traditions of this truly English art; in some of W. Fripp's warm, broad, sunny effects, notably in a charming little sketch of Southwold, and near Streathy, on the Thames (England), one recognizes the influence of a great master who for nearly half a century was closely connected with the water color society.

Mr. Mower Martin, R.C.A., was well represented by nearly a dozen sketches and drawings, executed with much vigor; the rather hard contrasts offered by the white, snow-topped mountains and the black green timber is scarcely true to nature, for there is always a haze, a mist, an atmospheric softening, as it were, even at sunset when the contrasts are most markedly hard; that Mr. Martin does find this softening effect is proved by some of his work, deep and rich in tone and color and certainly not lacking atmosphere; a little bit of wet cloudy April sky with patches of wet soft blue breaking through is a charming piece of sky, rock and tree; and a brilliant and luminous sketch of a siwash canoe silhoutted against a western sky out of which the sun has disappeared is admirable. Mr. Ferris' screen of water colors is chiefly made up of sketches in and around Vancouver, many pretty bits of sky and water, but we would suggest that he subordinate his foregrounds far more than he does at times, and that if he stippled less and washed or stained more he would gain both in breadth and transparency. This same lack of transparency is apparent in nearly every exhibitor's work. Water color should not be applied as an opaque, and the use of body color is entirely contrary to the traditions of the art and its best traditions; if it is desired to work in opaque mediums, why not adopt oils, pastels, tempora and so forth? The greatest beauty of water color is in its transcendental transparency of effect, which is never obtained in any other medium—the use of body color with water color is to acknowledge the want of ability to work in a legitimate manner.

Among the other exhibits in this class Miss McClung's "Fruit and Flowers" and Mrs. M. Garney's work in the same direction must be accounted much superior to the rest. Why does not the first named artist turn her attention to decorative painting, to which fruit and flower subjects are so peculiarly adaptable? A portrait study of a head by Miss Marstrandt was far and away the best black and white exhibited. The color of the neck cloth too closely approaches the tan of the flesh and mars to some extent the moulding of the chin; we should have referred to this lady's sketch in oils of a Chinese servant which shows considerable decision in treatment. Miss Marstrandt's second sketch in oils, a bit of a Lulet we think, is crude in color and harsh in treatment.

A capital piece of carving (W. F. Coulfield), of a chain of Dolphins leaping through a broken and following sea is boldly carved in English oak. A table with an inlaid top (W. Campbell), shows much technical skill and is certainly a handsome piece of work rather crudely designed, the legs being quite trivial and overladen with meaningless detail, but the workmanship throughout is first rate. A good type of quaint old Somersetshire table, known as a "court table," made in cedar by W. Bowman from a detail hy the President, was almost the only other exhibit in furniture. A fire screen designed by W. J. Bloomfield and executed in wood and leather with pyrographic decoration by Mrs. Ellis is admirable; the drawing the chief's head on the leather hanging is not quite in keeping with conventional treatment of the wood frame; the drawing of the head should have been

in the crude form characteristic of the genuine Indian drawing. Miss McClung's display of pyrography included a fine cedar chest and a number of smaller trifles in which were displayed taste and ingenuity.

Messrs. Henry Bloomfield & Sons had a fine exhibit of leaded glass and painted glass in which native flora appear frequently as the decorative motif, a step quite in the right direction. Some of the work, all of which is designed and executed entirely by members of the firm, was genuine leaded glass, that is to say, it was wholly dependent upon the utilizing of the lead lines for its drawing and to stained glass for its color, in contradistinction to painted glass, which is a picture painted upon a transparent ground.

In embroidery Mrs. Balfour Ker fully maintained her reputation. We regret to hear that Mrs. Balfour Ker intends to devote herself entirely to painting in the future. We trust this intention will not be adhered to as this lady's skill in the applied art quite exceeds her success as a pictorial artist.

When it is considered that the number of architects practising in British Columbia probably is nearly half a hundred it is surprising to find but three of that number exhibiting on the walls of the association. The disregard, not to say ignorant neglect, of the art of architecture by the public is not at all surprising. If the practice of the first and highest of the arts lie with men who are themselves so little appreciative of the real position of architecture in the world of art, or so little desirous of impressing upon the public the high nature of their vocation, what can be expected from that same public but a continued attitude of indifference? In this province an architect is so seldom believed to be an artist that if one does happen to dabble, say in water color sketching in a slight and amateurish manner, folks agree that "he is quite artistic" as though it were possible for a man to be worthy of the name of architect without being an artist, and as though there were so little scope for the exercise of artistic taste and knowledge in the vast field of unlimited opportunity to be found in decorative composition alone that the quite artistic one should be compelled to turn to trifling with pictorial art to there find scope for his artistic aspirations, restrained and cramped as they must be by the narrow limits of architecture! This is, no doubt, somewhat of a digression, but, really, an Arts and Crafts Association with scarcely a sign of the architectonic foundation upon which such associations must of necessity rest is a noteworthy curiosity. Beyond a sketch of the C.P.R. station at Vancouver by W. J. S. Parr and a neat pencil drawing of an everyday "alteration and addition" by W. Eveleigh, the only architectural drawings are by the President, whose large brown ink perspective of the Provincial Home at Kamloops was illustrated some four years ago in this magazine, as was also a design for a church in New Zealand. Among others we noticed a "rejected address" in the form of a design for a public school which was probably quite beyond the understanding of the school trustees, sketches for furniture, mantels, a chancel screen, all fully illustrated by details, and strongly drawn in brown ink and sepia after the president's characteristic method.

Mrs. Taylor exhibited a collection of photographs showing artistic perception in pose; all were soft in tone yet rather lacking in detail, probably the result of incorrect focussing of the subject to obtain the pleasing "so like a black and white, you know" effect. Messrs. Wadds Bros. also had an interesting show of photographs, one of which, a little child's head, is unaffectedly pretty and noticeably true as a photograph. But the photograph par excellence of the exhibition is a Rembrandtesque head by W. Eveleigh. Here we find all the extraordinary detail and sharpness of genuine photography, coupled with excellent pose and light, and beautiful printing. Two very large bromide enlargements by Miss Edwards must have been made from a remarkable negative, there being scarcely a defect in the enlargements.

Though mention is made last of the painted china shown by various members of the association, it must be frankly admitted that it was one of the decided successes of the exhibition. Miss Cohen, of Toronto, was represented by several pieces of decorated ware, beautifully painted and rich in tone. Among the pieces by Mrs. R. B. Ellis, a charming little jewel box and a fine punch bowl deserve more than passing attention, though all of this member's work is good. Miss McClung had some excellent work on the same tables, a pair of placques being particularly nice in color. Miss Drainie also contributed an interesting collection of examples of her skill and taste. Upon the whole, the china, as stated, was really good, showing clear painting and burning, but the natural forms so well reproduced were not always as decorative in their application and composition as they should be, and the conventional form was scarcely used — Mrs. Ellis' jewel box, decorated with a form of Persian arabesque, being the noticeable successful exception. No doubt difficulties present themselves when the decorative motif is a conventional treatment of a natural form, that do not appear where the natural form is merely copied more or less faithfully, and is really only a little picture of fruit or flowers painted on china, but the triumph of success is altogether disproportionately greater when the conventional treatment is happily brought about.

The association owes a large measure of the success of this, its first annual exhibition, to the energy of its zealous young secretary, W. C. Bloomfield; indeed, all the officers have worked earnestly to place the association upon a firm footing, and the promising nature of the exhibition just recorded, should encourage them to persevere in their good work. We had almost forgotten to make mention of the school competitions, open to children of various ages, not exceeding 16. Some 60 entries were adjudicated upon, some of them showing quite a little originality and care. It is to be hoped that the trustees of the public schools will in their turn do something to encourage and to develop a little artistic feeling and knowledge among the rising generations.

The building operations of the year must be considered in another letter, but mention must be made of a competition instituted by the C.P.R. for alterations and additions to the company's hotel at Vancouver. It appears that the building is to be almost entirely rebuilt, and several of the local architects have been invited to submit plans in the competition. The instructions (sic) are embodied in a chat with the manager, and competitors are expected to make their own surveys of the existing structure, a task of no small magnitude, if it is seriously intended to utilize it (the existing structure) to any considerable extent. It seems pre-

posterous that a large corporation like the C.P.R. should be too, shall we politely say, economical, to provide a few blue prints of the plans of the hotel as it now stands. If the competition is seriously meant it should be seriously constituted, with proper instructions drawn up with the assistance of a qualified assessor, to whom the designs should be submitted for criticism and comparison. Competitions have fallen to so low an ebb that it is well nigh hopeless for any one not having a "pull" to enter with any chance of success on merits; indeed, architects submit to "conditions" under which no self respecting association of builders would consent to furnish a single tender, and the architects have only themselves to blame if the building public accepts them at their own valuation.

THE PRACTICAL EDUCATION OF THE ARCHITECT.*

By Frederick Batchelor, F.R.I.B.A.

The advantages of general education and culture are called in question only by those who are wanting in them, but their influence on professional success is not perhaps so universally or so fully appreciated as one could wish.

The advantages of a general education to an architect are intensified by two things: namely, the more technical character that is gradually being given to it, and the catholicity of an architect's profession.

Wherever civilized man is found be he "Christian, Jew, Turk, Infidel or Heretick," he loves to make his homes, institutions, palaces and temples, not only cunning in contrivance, but each in its own way a little world of his aims and aspirations, a very Walhalla of all that is precious in art past and present, and to have impressed on each, and by a master hand, those individual, tribal and national characteristics which find more lasting if less vivid expression in architecture than the other fine arts. The designer has simultaneously to contrive, adorn and to find material expression in his work for the innermost habits and needs of every kind of client. The past may perhaps be peerless in monumental art, but I venture to think that nowhere has the range of a designer's sympathy had to be more catholic and encyclopædic than in the beautiful and loving domestic work which has marked this half-century's renaissance of architecture and its allied arts and crafts. When the tendency to the introduction of hand-and-eye training into most schemes of general education since the principles of Froebel and Slojd have been abroad is considered, it will be abundantly evident that not only has the architect's need for general education and culture advanced, but that the theory of the latter has developed on lines perhaps more akin to the calling of the architect than any other, except those of the sculptor and painter.

There can be no doubt that a sound course of general education must precede any special departure, but how soon that departure is to be introduced into the home, school or university is a misleading question. It assumes that there is but one answer, whereas there are as many answers as there are characters and callings. The Association has already done much, but I propose, with your help to organize in the coming session a regular series of technical demonstrations, both at works in progress and also in the workshop. A pupil may know the four volumes of Rivington's "Building Construction" by heart, and have visited all the works on which the staff in his office are engaged, and yet be unfit to supervise, for three reasons: Firstly, that every class of work does not necessarily find a place in the practice of even a very busy architect during the pupil's quinquennium; secondly, that a set of contractors has occasionally been known to do such good work as to deprive the pupils of their legitimate experience through rejection; and, thirdly, that visits to workshops and manufactories are quite as important as those to works in progress. I propose to meet the first want by arrangements such as have already been made with various architects and, occasionally, engineers to visit works in progress under their supervision. I do not anticipate insuperable difficulty in meeting the second want, but what we have yet to provide is a systematic series of demonstrations of good and bad materials and workmanship, and the means of distinguishing and appraising them, at sight and by applied test, taken, say, in the usual order of a specification. To meet the third want I look for the co-operation of the master-craftsmen, merchants and manufacturers in the neighbourhood of Dublin.

The timber trades alone will entail several pilgrimages. I question whether the most didactic among us would care to speak ex cathedra on the article itself. The stereotyed specification founded on the relations at one time rife between qualities, uses, ports of shipment, and market forms and marks is out of date, and the dearth of the dry red deals which stocked Dublin sheds in the good old days has not only introduced a new cult—that of the American baulk—but largely increased the demand for second Quebecs; whilst departures such as Kauri, and Oregon pines, sequoia, canary, maple, and cypress are courting attention and making new demands on technical demonstration. From the timber yards we might perhaps turn to the creosting works, and fill a few pages with notes on the process, the pounds per cubic foot injected for various uses, the pressures applied, and the depths of penetration. A visit like this, where we could handle the stuff, compare a few sawn sections, and pump the showman for all we were worth, would teach us more than a dozen text-book descriptions. After such a pleasant diversion our attention should be ripe for the saw mills and the carpentry and joinery shops.

The variety of sawn scantling now imported, especially from the Baltic, renders the appreciation of market forms in the importer's yard less problematical than when it was more confined to the log and the baulk, but it is in the saw mill perhaps that we have most to learn from technical demonstration. I imagine that one of the chief advantages of technical demonstration in the joinery shops to a Science and Art "pass" man would be the dispelling of his little illusions in regard to the present use of framed floors and tongued and grooved back-linings in cased frames. What a shock to discover that the girder and the binder have been ousted by the steel section, that the insinuating steel nail makes a better edged-joint than the time-honored tongue; that the tenacious tusk-tenon, the darling of his prettily-shaded isometrical details, is practically confined to trimming; and that so great a man as Viollet-le-Duc would drive it even from that refuge. What is even more wanted, because of its comparative neglect in this branch of technical education, is a similar demonstration in the shop-fitting and cabinet-making crafts; crafts whose niceties are only worked out by the specialist who can get a fair price and escape the demoralisation of the cut-throat competition now being fostered by government departments. I would conclude the series by an examination of some of the best examples of genuine old joinery and fittings in the last-century houses of Dublin, such as still linger in Henrietta Street, Rutland Square, Sackville Street, Kildare Street, or Ely Place; and of the old furniture in the Science and Art Museum, much of which might be measured and drawn with advantage. Few technical studies are so refining in their influence upon the design of architectural joinery as that of the good old furniture of the sixteenth, seventeenth, and eighteenth centuries, and there can be little doubt that the coarseness of the Gothic revival was largely due to its neglect. Another series of demonstrations which would very materially increase our stock of practical knowledge may possibly be arranged in connection with stone-mason's work. In these yards the various building stones in common use for constructional purposes, and also those employed in decoration and in sculpture, could be exhibited, and I hope, a number of valuable hints obtained from the master-mason's ripe experience as to what quarries have produced the stones best able to resist the disintegrating effects of our Irish climate. We would expect, too, that the flaws and defects peculiar to each description of stone would be pointed out. The methods of setting out the work and the subsequent operations of sawing, dressing, carving and polishing the stones would be demonstrated. Then again we have in Dublin quite exceptional opportunities for seeing in well-equipped workshops art metal work, constructional steelwork and foundry work in all stages of production. I venture to think that if the young architect would avail himself of the opportunities now held out to him to increase his stock of practical knowledge, that knowledge would react most beneficially, not only on the morality of the master smith, but on the pocket of his clients. He would no longer create designs, presumably for wrought-iron, which could be produced only at excessive cost in that material, or else in the form of a malleable casting which might deceive both architect and client alike.

In the details of plumber's work the average architectura student or assistant is lamentably ignorant. He is probably acquainted with the first principles of sanitary plumbing; he will not, for example, leave a soil-pipe without ventilation; he will arrange for the disconnection of the house drain from the sewer, and he may even provide for a proper current of air through the drains; but when questions are put to him by the ingenious plumber concerning the laying-out of the hot-water circulating pipes or the connection of the w. c. trap with the soil-pipe, he is liable to be placed in a position not entirely compatible with the dignity of the "arkos tectone."

From plumbing work it is not a far cry, in Dublin at all events, to enter the establishments of the master painters, for in more than one instance these trades, curiously enough, are combined.

Pilgrimages of similar scope, to the haunts of all the crafts that an architect calls to his aid, in ecclesiastical, civil, or domestic work, are in contemplation.

I have tried to put before you the paramount need of general education, of improved opportunities in the technical training which is our special stock-in-trade, and of the culture which refines their use and combines them to their best ends. Without a full measure of these things ambition is heavily handicapped. I speak, of course, of ambition in its broadest sense, the ambition to deserve and fill a niche in the Temple of Fame, not the mere instinct of self-preservation and successful plunder which we share with the domestic animal or the beast of prey; the desire to swell the store of wisdom already laid up in technical achievement and record, to raise and maintain the status of our calling, to extend without fear or favour the benefits of our ripe experience, to bear with and live down the prejudices or jealousies of our clients or fellows, and to feel ourselves efficient factors in private, social and national life—citizens, in fact, of no mean city.

I have not spoken of personal gifts, but without a fair heritage of aptitude, fostered in the hope of something better than by-ends, the seed may fall on barren soil. If we cannot choose we can at least cherish them, so that when our barns and armouries are fuller than those of the less gifted or thrifty, we can draw upon ripened grain, or take down a burnished weapon from the rack.

* From inaugural address delivered before the Architectural Association of Ireland, on October 9th, 1900.

CHURCH ARCHITECTURE IN NORTHERN FRANCE.*

By Professor J. Squair.

The subject of architecture is one possessing many aspects. We may, for instance, regard buildings from a mathematical or æsthetical standpoint; or we may consider them as successful adaptions of refractory materials to the purposes of utility or beauty, or we may consider them as reflecting the ideas and tendencies which characterize the age to which they belong. The latter is the one to which we shall confine our attention at present.

The art of France in the Middle Ages is one of great richness and variety. All the forms of literature flourished: epic poetry, lyric poetry, the drama and the chronicle. Sculpture was carried to a high state of excellence. But the architecture of the period is the richest form of artistic legacy bequeathed to modern times. An attempt has been made in the nineteenth century to revive an interest in mediæval literature and many beautiful things have been brought to our notice which were overlooked by the men of the seventeenth and eighteenth centuries. Scholars and critics have republished and expounded and sometimes modernized the great epics and dramas of the Middle Ages, but it is doubtful whether any permanent vogue regarding these works will ever be re-established. Some of great patriotic value such as the Chanson de Roland, or some of the beautiful lyrics appeal strongly to men of our time and will not be forgotten, but the number of ancient poems secured from oblivion will be small. Quite otherwise is it with architecture. Here, all the samples of mediæval art which remain are regarded with the greatest favor. The contempt which was heaped upon them by men of classical tastes has been forgotten and they have become models for the architects of to-day.

Church architecture in France in the Middle Ages is represented by two great types, the Romanesque and the Gothic. Notre-Dame de Poitiers, of the end of the eleventh century, is a sample of the Romanesque style. It is an oblong building of a type developed from the Roman basilica. Its nave and transept form a cross, its arches are round, its walls are low, and the flying buttresses are absent. From the Romanesque style was developed the Gothic. The same cruciform ground-plan is at the basis of both, but the Gothic takes an enormous flight upward. The nave becomes very high, to support which the flying-buttresses so characteristic of the Gothic style are developed. The façade undergoes marked changes, the great towers become a striking feature. Beautiful details like the rose-window and the delicate arcades are invented. The pointed arch gives also opportunities for richer sculptural displays. In the Gothic church mediæval architecture reached its climax. The great cathedrals of Paris, Reims, Amiens, Chartres, etc., have never been surpassed by other buildings in point of beauty. The thirteenth century is the period of highest excellence, but the style was continued for a century or two later.

In the fifteenth and sixteenth centuries the new movements to which the name of the Renaissance is given led men to consider more closely the art of Grecian and Roman antiquity. The result in architecture was that they began to show contempt for Gothic style and to introduce features drawn from the styles of Greece and Rome. In the façade of Saint-Etienne du Mont, of the beginning of the sixteenth century, we see this mingling of the styles. There is a Romanesque tower, a Gothic rose-window with a Grecian colonnade and pediment. After the completion of St. Peter's at Rome it became the fashion for a couple of centuries or more to build churches of a domical structure, like St. Peter's. Such are the churches of the Sorbonne, the Invalides, the Panthéon of Paris and many others. The Grecian colonnade and pediment coupled with the Roman dome are the striking features of the churches throughout the period known as the Classical in literature. The very word Gothic became a synonym for barbarous. Nothing was in good taste that was not of Grecian origin. This is one of the most striking phenomena in the history of art. The men of the Renaissance did not cast aside the Gothic style and adopt the Classical because the latter was intrinsically more artistic. Indeed, it is doubtful if it was so. They really rejected the Gothic and adopted the Classical because, under the charm of the superior Classical philosophy and poetry, they rejected their own mediæval literature and, along with it, what was no part of it, their mediæval architecture.

The church of the Madeleine of the year 1807 represents a new phase of development. It is true that it was intended by Napoleon not as a Christian church but as a temple of glory, and so could be fashioned more appropriately after the model of a pagan edifice. But that is not the only reason for its being an almost exact copy of a Grecian temple. It is easy to see by comparing, for instance, Saint-Etienne du Mont (1517) with the Panthéon (1764) that originality of design was waning. The Madeleine marks the close of the eras of invention and the beginning of the era of imitation. It is a far cry from the free spirit of foventiveness which produced a façade like that of Reims to the spirit of imitation which produced the colonnade, however beautiful, of the Madeleine. The nineteenth century is the age when men are more anxious to secure historical accuracy than to invent bold, striking novelties. The field from which to choose models has been very much widened, however, since the Romantic movement of 1830. Hugo and his contemporaries turned their attention to mediæval art and rediscovered, so to speak, the Gothic cathedral. That graceful form became again an object of admiration, and architects took it as a model for modern structures. But Romanesque and Classical models are not excluded. In fact, nearly all types of buildings are copied in our time. The two great characteristics of modern architecture are variety of style and, what may seem paradoxical, lack of originality.

* Abstract of a lecture delivered on November 19th before the Modern Language Club of University College, Toronto.

CANADIAN SOLDIERS' MEMORIALS.

With regard to this subject, Mr. A. T. Taylor, F.R.I.B.A., Montreal, writes as follows:

"I am heartily in sympathy with the project of erecting permanent memorials of the Canadian contingents who did such splendid work in South Africa in all the chief centres. Such deeds should be commemorated as an incentive for ourselves and for our children. The form you suggest for Toronto, viz., a triumphal arch, is particularly suitable, as not only following the precedent of great nations of the past, but also as being always a striking architectural feature in any city. In New York the temporary "Dewey" arch is still standing and is universally felt to be a high sounding clear note in the architectural discord of that city."

THE ONTARIO ASSOCIATION OF ARCHITECTS.

The formal opening of the new rooms which have recently been fitted up to serve as the headquarters of the Association, was celebrated by a dinner held in the Assembly Room on the evening of the 11th inst. There were present about fifty members and invited guests. The chair was occupied by the President, Mr. A. F. Wickson, having on his right the Rev. Professor Clark and on his left Professor Galbraith, Principal of the School of Practical Science. The principal feature of the occasion was an interesting address on "Architecture," by Professor Clark, a synopsis of which we hope to have the privilege of publishing in a future number. The new rooms have been partially furnished and already present an attractive appearance. The furniture in the architects' rooms was specially designed by members of the Association. It is the purpose to hold monthly meetings of the Association at which papers and discussions will form the principal feature. The rooms contain the Association Library and other interesting literature, and will be open at all times to members.

It is proposed to postpone the Convention of the Ontario Association of Architects until the 29th and 30th of January, the same week as the Architectural Exhibition of the Eighteen Club.

THE BUILDER

[THIS DEPARTMENT IS DESIGNED TO FURNISH INFORMATION SUITED TO THE REQUIREMENTS OF THE BUILDING TRADES. READERS ARE INVITED TO ASSIST IN MAKING IT AS HELPFUL AS POSSIBLE BY CONTRIBUTING OF THEIR EXPERIENCE, AND BY ASKING FOR PARTICULAR INFORMATION WHICH THEY MAY AT ANY TIME REQUIRE.]

Some Hints for Mill men.

Mill men are often called upon to get out stuff of various kinds for which no provision has been made for working out with the machines at their command. With a

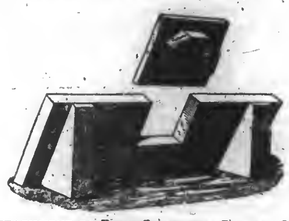

FIG. 1.—ATTACHMENT TO BAND SAWS, FOR SAWING ORNAMENTS.

band-saw, and the attachments illustrated herewith, a great variety of ornamental blocks may be produced, some of which are shown in the illustrations presented at Fig. 3. The attachment shown at Fig. 1, which is made of wood, and which any mechanic can make, has

FIG. 2.—ATTACHMENT IN OPERATION.

been used in some shops many years, and in some localities the ornaments produced by it have become quite popular for a variety of purposes. The attachment as shown at Fig. 1 may be made to cut at any

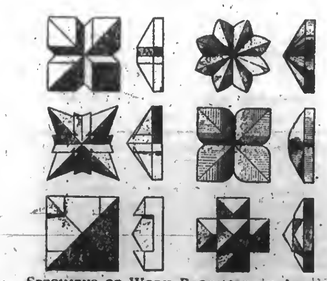

FIG. 3.—SPECIMENS OF WORK PRODUCED BY ATTACHMENT.

angle, but if made to cut at 60 degrees it will be found as useful as any perhaps. By its use hundreds of designs can be produced, the variety being limited only by the taste and skill of the operator. The few examples shown at Fig. 3 give some idea of the character of the work that can be produced, and in case an ornament or a different number of sides from 4 to 8 is desirable, the gain shown and the block may be made to suit. The manner of operating is shown at Fig. 2, when the saw is forming the cross ornament. It is necessary the block should have as many sides as the desired ornament, and that the gain be made to fit the block. It is

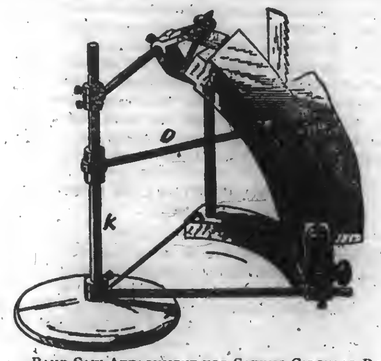

FIG. 4.—BAND SAW ATTACHMENT FOR SAWING CIRCULAR RAILS.

evident from the foregoing that many designs of center ornaments, rosettes, head-blocks, etc., that have been hitherto cut or carved by hand, may be readily and expeditiously sawn on either a scroll-saw or a band-saw. The size of the device is not material. It should, however, be proportioned to the size of the work to be done.

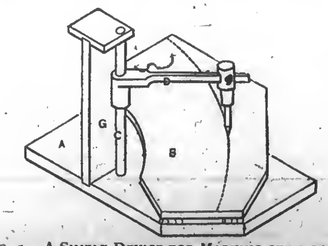

FIG. 5.—A SIMPLE DEVICE FOR MARKING OFF A RAIL.

For example, for a 3-inch rosette it would be well to make Fig. 1 about one foot long and four inches high. The gain in the inclined piece should be about 2¼ inches square and the block should fit neatly in the gain of the inclined piece. The gain and the block may be square or semi-circular. The following direction will indicate how the attachment is to be used: Cut the face figure of the ornament first, then fasten it to the block by means of wood screws as shown. Drop the

block into the gain in the inclined piece, first laying off the edges as they are to be sawn. It will be noticed in the accompanying sketches of work that the edges are all simply gauged an equal distance from the back. This, however, can be varied sometimes with good effect. The skilful operator will evolve many designs of ornament not even suggested in this brief description when he becomes accustomed to the method of working the attachment.

Cutting Circular Rail With Band-saw.

To make a hand-rail for a circular stairway has always been considered quite an achievement for the ordinary joiner to perform, though the expert finds no trouble in laying out and completing the work. The device shown at Fig. 4 was invented so that the process of forming such a rail might be simplified. This device as here presented was patented in the United States many years ago, but it seems never to have come into general use for some reason or another. The plank from which

FIG. 6.—SAWING COVES.

the rail is to be made is set up to the pitch of the stair, and the marker O which slides up and down the standard K makes the lines where the plank is to be cut for the rail. The pencil or scribe is fastened in a socket at A, the socket being moveable on the arm so as to be available at any point within the limit of the arm. The principle is an old one, in fact, as old as the works of Langley, Paine or Moxon. Another device for laying out a rail is shown at Fig. 5 which may be attached to a band-saw or to scroll saw. This machine is much simpler than the previous one. It may all be made of wood by any skilful mechanic. A shows the bace of the machine, B, an inclined board which may be hinged to the base plank. A, C, is a standard with a cap through which a rod G is fixed. The standard C carries a moveable arm D, which has a slider carrying a pencil attached. This pencil-holder slides along the arm D, in order to suit the diameter wanted. When a pattern for the rail is to be made the hinged board B is raised to the pitch of the stairs, and the pencil point is moved until the proper diameter is reached, when a line like the one dotted is drawn. The inside line is also drawn when the paper or board on which the lines are drawn, are removed and the curver transferred to the plank to be cut. The plank is then cut by the band-saw or the scroll saw, while the plank is set up on a rake which is the pitch of the stairs. By this method the proper curve and

FIG. 7.—ARRANGING SAW GAUGE.

the correct bevels are obtained; two very important items in hand-rail construction.

Some Kinks in Circular Saw Work.

THE form of outline of the slot or groove made by a circular saw not only depends on the size and the position it occupies on the saw arbor, but on the direction the material being worked is also moving. If we take a block of wood and move it across the bench lengthwise, the saw will simply cut a slot the width equal to the set, and the depth depending on the height of the table above the saw arbor. If we drive a block at right angles, or square across the saw table, a groove will be formed, having a cross section in the shape of a segment of a circle; any other direction will give a similar part of an ellipse. In Fig. 6 is shown a variety of work cut out on this principle. No. 1 is a

FIG. 8.—SAWING GROOVES AND DOVETAILS.

block cut out for lagging a pulley, or similar work; the other figures show various patterns, all of which may be cut out with a circular saw. When it is required to cut a circular groove of a given size at a saw bench, the table can be raised and the saw gauge set to the proper angle by means of the diagram shown in Fig. 7. If it is required to groove out the

block A to the line C A D, on the saw bench, using a twelve inch saw, first draw the circle E M D, twelve inches in diameter, the same as the saw, then lay off on the radius E K, E F, equal to A B, and draw a line at right angles for the surface of the table. With F for the center draw the circle T H V, equal in diameter to C D. Now the line passing through M, and touching the circle at T, will make the required angle with the line M I. From the point M, lay off at right angles to S M, M L, equal to D N; set the saw gauge at this point, with the angle already found, and the saw bench is ready for the work. The teeth of the saw, for this purpose, should be very coarse, and filed so as to cut the whole length of their sides as well as their points. If three or more of the teeth could be made shorter than the rest, and at the same time given more set, it would improve its working qualities greatly. When the saw is fastened to the arbor by means of two wedge shaped collars, the same will "wobble" or "stagger", and will cut a groove, having parallel sides, but the bottom will be concave in sections, as shown in the first diagram in Fig. 8. This can be made to give a flat bottom to the groove by jointing the saw while in motion, as shown in the second figure. By setting the saw off from the center, one corner of the groove will be made deeper than the other, but the sides will remain parallel. A dovetailed shaped groove may be made by tilting the stuff first on one side, and afterwards on the other, specimens of the dovetailed groove are shown in the lower sketches. Door stiles and door rails may be plowed for the panels by "wobbling" the saw as shown, and the panels get a better "grip' when fitting in a sawn groove. The size of the groove may readily be obtained by the proper adjustment of the bevelled washers; they can be turned on the arbor to give the saw the proper angle, and when the right position is once found, the washers and the saw can be marked, and the same adjustment can be made with little trouble when the same size of a groove is wanted. The bevel washers may be made of hardwood—maple being about as good as any—and one pair of washers may be used for several sizes of grooves. The washers, if made of wood, should fit loosely in the arbor and should be true on both face, and each should be the exact counterpart of the other. In fact, it is better, when making the washers, to make the two out of one piece of stuff, boring the hole first, and then sawing them across the hole to the proper bevel. The iron collar and outside washer must be retained on the mandrel. The first bevel washer fits against the collar, then the saw is run on, then the round wooden washer, with its thick end opposite to the thin end of the first washer, then the rim washer, which must be followed by the tightening nut. The saw will then stand at an angle with the mandrel, and this is the object attained.

The Hanover Portland Cement Company are enlarging the capacity of their works from 200 barrels to 300 barrels per day.

PROMINENT CONTRACTORS

MR. J. B. MCMANUS.

One of the best known contractors of late years in the Maritime provinces is Mr. J. B. McManus of Memramcook, N. B., who has become particularly known as a builder of sub-structures in bridge work, and who has been handling large contracts of a general character though he seldom now turns his attention to the erection of buildings.

Mr. McManus was born in Memramcook in 1846 and is a son of Terrance McManus, a native of the north of Ireland who settled in New Brunswick when about twenty years of age, and who for some years with his sons did business under the name of T. McManus & Sons.

For some twenty years previous to 1894 J. B. McManus and his brother J. W. McManus were the only members of the old firm. At that date they dissolved the partnership and each is now doing business under his own name.

Mr. McManus does a large amount of work throughout the Maritime provinces and in New Brunswick especially for the Provincial and Dominion governments.

Among the many contracts handled during the last few years might be mentioned the building of two large breakwaters in the summer of 1899, one in Kings and one in Shelburne county; also one that cost $20,000 in Guysboro county. In company with other well known builders, who formed with him the firm McManus, Lowe & McManus, he aided in the construction of the big under blast and open hearth furnaces at Sydney, C.B., for the Dominion Iron & Steel Co., the cost of which approximated $60,000.

Mr. McManus is just completing for himself a residence in Memramcook which is one of the finest in that section.

METHOD OF FINDING DIRECTION OF JOINTS IN ELLIPTICAL ARCHES.

EDITOR CANADIAN ARCHITECT AND BUILDER:

DEAR SIR,—Your diagram Fig. 1 in this month's BUILDER showing the manner of finding the direction of joints in semi elliptical arch, is not correct. The tangent as shown, or at least a line parallel with a tangent, is all right when applied to circles, but wrong in a semi ellipse. The most practical way to correctly draw those points when a semi ellipse has been drawn with a string is to draw lines from the foci to the point where the joint is required and bisect the angle thus obtained, which will be the correct joint.

JOHN HANRAHAN.

ANSWER.—Theoretically our correspondent is quite right, but his method is not in general use among bricklayers as it takes too much time to obtain the correct lines, and the method shown in Fig. 1, November issue, is often employed instead because of its quick application, and it is approximately correct. Most so-called elliptical arches are simply semi-ovals, being composed of segments of circles, and the rule given applies to such arches with correct results.

The coroner's jury at Ottawa charges the city building inspector with dereliction of duty in allowing an imperfect wall to remain standing. The falling of the wall recently caused the death of two persons.

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AGENTS FOR CANADA

BUILDING MATTERS IN PRINCE EDWARD ISLAND.

[BY A TRAVELLING CORRESPONDENT]

In the last year building operations have been a good average in Prince Edward Island, though at the beginning of the year the prospects seemed very poor. A very good class of larger buildings has been erected, including a number of churches and other public buildings.

There are a few fairly important works now in process of completion, and large buildings will be proceeded with next year.

Business in most other lines has been prosperous and trade have been brisk. On the western end of the Island the construction of the new railroad, which is to extend eastward across the river from Charlottetown, involving a large expenditure for a bridge, which is over a mile in length, will mean a great outlay in money on the Island, and must surely fortell much building construction apart from the railway. Tenders for this railway work have already been clored, and spring will see construction begin.

An Engineer has for some time been engaged inspecting quarries located along the Nothumberland Straits between here and Newcastle, N.B., in the interests of M. J. Haney of Toronto, contractor for the sub-structure of the Hillsboro Railway Bridge near Charlottetown. The stone may be purchased from some quarry, a quarry may be bought out, or if a suitable location be found, a new one may be established; about 60,000 yards of stone may be required. The contractor is now getting his materials on the ground, and construction will begin as soon as navigation opens. The bridge and approaches is 4500 feet over all, having 13 piers and abutments, the 14 spans being 210 feet each. The depth varies to 60 feet, piers resting on piles or caissons. The bridge will be 25 feet above water. The substructure is to be completed in two years. Mr. Haney is of Toronto, and was one of the firm of Hugh Ryan & Co., who built the Sault St. Marie canal.

The Roman Catholic Church at Souris now under construction by contractors Duffy & McEachern, under W. C. Harris, architect, is of stone and will cost about $30,000. Souris stone is being used, which is of a reddish brown color. The walls are now raising, and the building is to be completed next October.

Few residences were erected in Charlottetown this year. All were of wood and were not expensive. Of public buildings in the city, some in particular should be noted.

The Prince of Wales College from plans by C. B. Chappell is of brick and stone from the Stevenson quarry in Wallace, N.S., with slate roof, size 132x80 with full basement and of two stories. The structure cost about $40,000.

The Prince Edward Island Hospital, recently completed under the same architect is of brick and stone, size 125x40 with a number of small ells. The main building is of three stories. There are 25 beds, public wards and 10 private rooms. The cost was $20,000.

The Brown dock built last year under C. B. Chappell is of brick with stone front. Size 80x70, 3 stories and cost $15,000.

The new Christian Church just completed by H. & S. Lowe, contractors, is of brick and stone, is not very large and cost about $5,000. It's erection was begun in the summer under W. C. Harris, architect.

An addition to the Hotel Davis, size 60x40, five stories cost $10,000. This was done last summer, C. B. Chappell, architect.

The addition of a large brick and stone wing to the Lunatic Asylum in Charlottetown is still being proceeded with, but is nearly finished. This wing is of size 200x40, three stories and basement, and is from plans by C. B. Chappell, architect. Wallace finestone was used. The cost is about $35,000.

The only large building, the erection of which is settled upon for the spring in Charlottetown seems to be the Derbrisay Co. block on Queen and Grafton streets. This is to be of stone and brick, size 40x60, and of three stories, to cost $10,000. W. C. Harris, architect; H. & S. Lowe, contractors, will start the job at once and proceed through the winter.

The new Sinclair and Stewart departmental store being constructed in Summerside by Messrs. Sherman & Lefurgy of that town, from plans and under supervision of C. B. Chappel, Architect, is taking shape as one of the finest structures on the Island. It is brick with front of brick and stone. Size 106x36, with a vault and elevator addition at the back of 10 fee depth. It is three stories in height with a large basement. The building compares most favorably with the big Holman departmental store block beside which it stands. It is to be finished early in the spring.

Messrs. Schurman, Lafurgy & Co., an old firm located in Summerside do a large business, and have a large plant in operation in that town. Recently they have taken many large contracts in Sydney, C.B., and now have quite a plant established there.

The Mechanics' Manufacturing Co., general contractors and builders, are doing a large portion of the Island trade now. The firm was organized and began business in Summerside four years ago. They have now large factory buildings, comprising a main shop of two stories, 60x50 with one ell of 25x30, and another of 35x30, in addition to large dry kilns, furnace and engine rooms, etc. The firm imports lumber, including all that they require for their own use, and now they have some $8,000 worth of stock on hand. The past season has been a busy one with them. Among other buildings erected this year by them, are:—St. John's Anglican Church in Milton, and the Indian River Roman Catholic Church, which are not yet finished. The latter is of wood, size 117x65, and will cost from $12,000 to $15,000.

C. B. Chappell, architect, of Charlottetown, made the plans and supervised the large new Halifax Herald building now being erected. His plans for the Sydney Academy in Cape Breton, made in competition, were accepted and the building was begun last August. It's size is 106x75, two stories and basement. Messrs. Schurman & Lefurgy, of Summerside, have the contract at $30,000. The building, which is of brick and stone, will probably cost about $40,000.

Mr. W. C. Harris, architect, for many years in Charlottetown, is now located at Halifax. Besides the church at Souris, he made the plans of several wooden Roman Catholic Churches now being erected on the Island.

Since its organization only eighteen months age the British Fire Prevention Committee has made sixty-three tests of materials as follows: Fire-resisting floors, twelve; ceilings, two; fire-resisting partitions, nine; different forms of wood and iron doors, twenty-three; various forms of glazing, eight. Besides this there have been several odd tests with treated wood, fire curtains, fire blinds, girder coverings and safes.

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QUANTITIES OF MORTAR REQUIRED FOR BRICKWORK.

VANCOUVER, Nov. 24th, 1900.

Editor CANADIAN ARCHITECT AND BUILDER.

SIR,—In an article in the CANADIAN ARCHITECT AND BUILDER for October last, under the heading of "Quantities of Mortar Required for Brick per M" (page 196) it is stated that for a joint of ¼ to ⅜ in. brickwork, it will require 4 to 5 cubic feet of mortar to 1 M bricks, or say an equivalent of 2 feet 6 inches per cubic yard.

In the CONTRACT RECORD of Oct. 17th, page 4, under the heading of "Brickwork" it is stated that one cubic yard of mortar will lay 80 feet of brickwork, or three cubic yards. Now a third of a cubic yard of mortar is 9 feet, that is equivalent to 9 cubic feet of mortar to one cubic yard.

Result—Author of article in CANADIAN ARCHITECT AND BUILDER, 2 feet 6 inches of mortar to 1 yard of brick. Author of article in CONTRACT RECORD, 9 feet of mortar to 1 yard of brick.

If the editor will kindly give some accepted authority on this question it might be the means of preventing some beginner from being led astray by one of the above contradictions.

Yours very truly

THOS. BRADBURY.

[With regard to estimating the amount of mortar required to lay a cubic yard of brick-work, authorities seem to differ; this disagreement is, doubtless due to the fact that the sizes of bricks differ, some being made 8 inches long by 2 inches thick and 4 inches wide, while others are 9 x 4½ x 2½ inches. The smaller the bricks the greater number of joints, and consequently a larger amount of mortar will be required. For ordinary sized Canadian bricks, five tiers make one foot in height, therefore it requires 15 bricks to make one yard in height. This requires 15 joints, one quarter of an inch thick of mortar; in other words we have 15 horizontal joints a quarter of an inch thick and 3 x 3 feet area, in one cubic yard of brick-work. This would make a mass of mortar 3¾ inches thick, and 3 feet x 3 feet. Then we have 12 vertical joints in a cubic yard of brick-work, which also measure ¼ inch by 3 feet 3 feet each, which gives another mass of mortar 3 inches thick by 3 feet x 3 feet, less, of course, the thickness of the total horizontal joints, which will be allowed for waste etc., in this estimate. Now we have a mass of mortar as follows: 3¾ inches x 3 feet x 3 feet for horizontal joints, and 3 inches x 3 feet x 3 feet for vertical joints, or a total of 6¾ inches x 3 feet x 3 feet for the amount required to lay a solid cubic yard of brick-work. According to this estimate, which gives three joints extra for waste, etc., it requires about 4¾ cubic feet of mortar to lay one cubic yard of brickwork, but as this estimate does not make deductions for voids in slack joints, cross joints, etc., it must be evident the estimate is in excess of the requirements, though it is best when estimating to allow for the larger quantity.

Quoting an American authority on the subject (Trautwine) we get the following:

THICKNESS OF JOINTS	PROPORTION OF MORTAR	NO. OF BRICKS PER CUBIC YD.	NO. OF BRICKS PER CUBIC FT.
⅛	About 1-9	638	23.63
¼	" ¼	574	21.26
⅜	" 3-10	522	19.33
½	" ⅓	475	17.60
⅝	" 4-10	433	16.04

As these figures are based on bricks measuring only 8¼ x 4 x 2 inches the amount of mortar required to lay a cubic yard is manifestly greater than would be necessary to lay a cubic yard with Canadian bricks.

An English authority (Seddon) tells us that it requires to lay a cubic yard of brickwork "⅓ of a yard of good lime and a quarter of a yard of sand."

Professor Ira Baker in his "Treatise on Masonry Construction" says, "1 cubic yard of mortar will lay from 67 to 80 cubic feet of brickwork," and "from 90 to 108 cubic feet of brickwork with ⅜ to ¼ inch joints." This rule is also quoted in Kidder's Building Construction and Superintendence."

From the foregoing it will be seen that authorities differ somewhat, but to Canadian estimators the first figures presented in this article, namely, 4¾ cubic feet of mortar for each cubic yard of brickwork will be nearer the correct thing than either the English or American rules, that is to say, that from 0.25 to 0.30 cubic yards of mortar will be sufficient to lay one cubic yard of Canadian bricks.—THE AUTHOR OF THE ARTICLE.]

[NOTE.—The article in THE CONTRACT RECORD to which reference is made by our correspondent, was republished from the St. Louis Builder. — Editor C. A. & B.]

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BUILDING MATTERS IN VANCOUVER.

The annual election of officers of the Vancouver Builders' Exchange was held recently. Only two changes were made in the personnel of the Board of Directors. Mr. W. Hepburn, succeeded Mr. C. T. Shindler as Vice-President and Mr. D. M. Fraser is replaced by Mr. R. P. Forshaw.

The Exchange cannot be said to have prospered during the year to the extent which was anticipated. In the opinion of some of the older members, a mistake was made when the annual fee was reduced to $25.

The change resulted in bringing in a member of new members, many of whom appear to have looked only for immediate personal benefits in return for their investment, forgetting the advantage which must accrue to all if by united effort trade abuses can be remedied and the business of the builder placed on a more equitable and profitable footing. The proposition has been made to raise the membership fee, and profiting by past experience it is hoped that the affairs of the Exchange may in future be managed in such a way as to ensure a larger measure of success.

The effort to induce the architects to organize and work in harmony with the Exchange failed, as did also the movement to secure the adoption of a uniform contract.

The rainy season has set in and in consequence building operations will be conducted on a smaller scale until spring.

BUILDING AT OTTAWA.

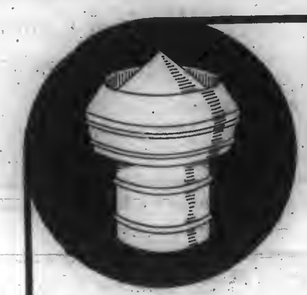
The following statistics show the character and extent of building operations in Ottawa during the building season which is about to close:

The number of solid brick or stone buildings or what may be termed first-class structures, erected during the year is 94, the estimate total cost being $391,600, of these only 10 are below $1,000, and but ten of $10,000 and over, the highest being $50,000. The great bulk, or 74 of the buildings, range from $2,000 up to $6,000 in cost.

Of second class buildings known as brick veneered structures there have been erected 187 at a total cost of $280,450. Of these 27 are placed below $1,000, and six at over $3,000, being in all cases blocks of several houses or stores, leaving 154 buildings erected at an average of $2,000 each.

The local architects state that very little work has come to them as the result of the great fire which destroyed a large portion of the city early in the year. The burned district did not include the business section of the city. The buildings destroyed were principally wooden houses of a cheap character. These have been replaced by structures of a little better description, but such as only called for the services of the local builder.

The Danish Elevator and Hoist Regulations provide, among other things, that the car must be suspended by at least two ropes or chains each of which must alone be strong enough to carry ten times the weight of the car fully loaded.



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PERSONAL.

I. S. Russell, architect, Stratford, Ont., who has been ill for some time is now convalescent.

Mr. Frederick F. Saunders, architect, has recently opened an office at No. 45 Lippincott Street, Toronto.

Messrs. W. A. Langton and Gregg & Gregg, architects, have recently removed to new offices at No. 94 King Street West, Toronto.

Messrs. Sproatt & Rolph, architects, Toronto, will shortly remove from the Bank of Commerce Building to more commodious offices at No. 94 King Street West.

Mr. W. T. Dalton, architect, of Vancouver, B. C., is about to leave for England, on a vacation. He proposes to spend the greater part of the winter in the old land.

Mr. W. A. Langton recently delivered lectures on various phases of architectural education and work before the students at the Normal School, Toronto, and the members of the School Art Leagues.

Mr. A. Gobeil who entered the Department of Public Works at Ottawa in the year 1872, and has for a number of years past occupied the position of Deputy Minister of Public Works, has made application for superannuation. Mr. Gobeil has been a most efficient public officer.

PUBLICATIONS.

In order to disseminate as widely as possible a better knowledge of explosives and their employment and thus reduce the risk and promote efficiency of blasting operations, the Toronto Bureau of Mines has just issued a pamphlet of 136 pages dealing with this important subject. The author is Prof. Courtenay DeKalb of the Kingston School of Mining, who is also Inspector of Mines for Eastern Ontario. The Commissioner of Crown Lands is taking steps to place a copy of this work in the hands of every mine and quarry manager, captain and foreman in Ontario, free of charge, in the hope that a perusal of its contents may lead to a diminution in the number of accidents resulting from the use of explosives. Other persons may procure a copy for the nominal charge of 25 cents on application to Thos. W. Gibson, Department of Crown Lands, Toronto.

The Amherst Red Stone Quarry Co. have turned out material for a number of large and well known buildings the last few years, including the Baptist church in Amherst erected a few years ago at a cost of $35,000; the handsome brick and stone Presbyterian church on the same street which was built last year at a cost of $23,000; the new Bank of Nova Scotia now about completed in Sussex, N. B., (this building is entirely of dressed stone and it has been found that the Amherst red stone can be worked with great ease); the Merchants' Bank of Halifax in Truro and the Roy building in Halifax contain this stone. It was used in the new Portland school house in St. John, and considerable has been sent recently to D. J. Leonys & Son, Granby, Que. The stone maiotains its color well and hardens with exposure. The quarry which is just outside of Amherst is 150 feet in length and is now 40 feet deep. It is well fitted with lifting apparatus with engines of 60 h.p. It is under the management of Jas. Donald of Amherst.

ARCHITECTS!

The Toronto Architectural Eighteen Club desires to have your names and addresses for the purpose of sending you one of their illustrated "Annual Exhibition Catalogues."

ERNEST R. ROLPH,
Secretary-treasurer,
Bank of Commerce Bldg,
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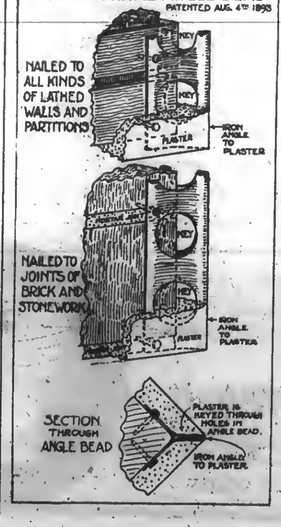

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CANADIAN ARCHITECT AND BUILDER
DECEMBER, 1900.

CHAPEL IN ST. JAMES' CEMETERY, TORONTO.

SUBJECT FOR RENDERING IN TORONTO ARCHITECTURAL EIGHTEEN CLUB'S STUDENTS' COMPETITION, (SEE STUDENTS' DEPARTMENT).

THIS PAGE RESERVED EACH MONTH FOR THE TORONTO ARCHITECTURAL EIGHTEEN CLUB.

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LE PANTHÉON.

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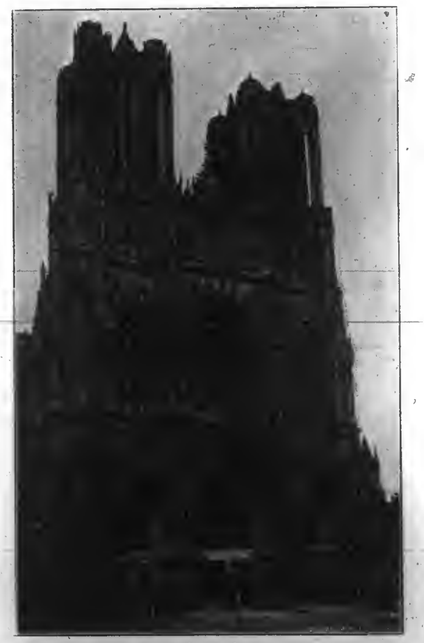

LA CATHÉDRAL DE REIMS.

ILLUSTRATIONS ACCOMPANYING PROFESSOR SQUAIR'S LECTURE ON "CHURCH ARCHITECTURE IN NORTHERN FRANCE," IN THIS NUMBER.

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ANDREW T. TAYLOR, F.R.I.B.A., ARCHITECT.

SUPPLMENT TO
CANADIAN ARCHITECT AND BUILDER
DECEMBER, 1900.

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INDEX

Architectural Training - - - - 3
American Institute of Architects - - 5, 25
Architectural Training for Canadian Students 6, 7
Art Museum as a Memorial to Queen Victoria - 26
Architect, a Twentieth Century - - - 56
Armoured Cement - - - - - vi-No. 3
Architects, Licensing of - - - - - 73
Architectural Students' Club - - - - 90
Art Gallery in Toronto, the Proposed - - 113
Arch, a $ 0,000 - - - - - - 133
Air and Water, Relating to Pressure - vi, No. 7
Architectura Emotio - - - - - - 146
Architecture, Lectures on - - - - - 172
American and Continental Heating Practices and Appliances - - - - - - 203
Architecture, Romanesque, Classification of - 121
Architectural League of America - - - 124
Artists, Canadian Awards to - - - - 1 2
Architecture and Engineering at McGill - 163, 164
Architects at Cricket - - - - - 166
American Institute of Architects - - - 176
Architects and Engineers in Building Construction 187
Architecture, Ideals in - - - 188, 189
Architectural Education - - - - 199

Building Failures - - - - - - 3
By the Way - 14, 59, 135, 136, 147, 160, 184, 197
Building in Toronto - - - - - - 16
Baker, F. S. - - - - - - - 32
Building Outlook, The - - - - - 74
British Columbia Letters - - - 80, 155
Building Regulations, Proposed New - - 87
Blue Prints, to Intensify - - - - 112,
Brick Immersion Tests - - - - - 119
Bricks, an effort to Secure Uniformity in Size - 25
Building Conditions - - - - - 132, 6
Building By-Laws, Toronto City - - 133, 170
Bricks, a Regular Size fo - - - - 134
Boston and New York, A Visit to - - 183
Building By-Law of Toronto the Amended - 195
British Columbia Letters - - - 142, 143

Century's Review, A - - - - - 1
Construction of Ice Houses, The - - - 8
Correction, A - - - - - - - 65
Contracting Firm, A New - - - - 92
Concrete, the Effect of Freezing on - - 90
Cement Testing Device, a Useful - - - 92
Chicago, Building in - - - - - 108
Canadian Pavilion at Glasgow Exhibition - 130
Capital and Labor - - - - - 145
Contracts, Building - - - - 148, 149, 150
Construction, Methods of, in Relation to Cost of Insurance - - - - vii, No. 8
Commendable Idea, A - - - - - 157
Canadian Northwest, Development of the - 109
Cement, a Sulphur and Sand - - - - 174
Canadian Architect in Korea A - - - 179
Canadian Society of Civil Engineers 28, 100, 172
Commercial Age, The - - - - - 122
Correspondence - - - - - - 191
Competition, an Important - - - - 57
City Mapping, Modern - - - - - 80
Competition, Manufacturers' Arch - - - 151
Central Square for Toronto - - - - 164
Canadian Architect - - - - - 177
Color in Architecture - - - - - 198

Designing of Public Buildings - - - - 2
Dominion Exhibition, A - - - - - 50
Designing Small Houses and Cottages, the Art of - - - - - 75, 75, 77, 78
Decoration Methods and Materials - 116, 1-7
Dams, Reservoir, Accidents to - - - 120
Drains, Who Should Lay the - - ix No. 8
Decision, An Important - - - - - 158
Drop Test, Value of the - - - - 194
Design, the Logic of Architectural - - 10, 11
Decorators and Furnishers, Suggestions for - 124

Engineers vs. Architects - - - - - 65
Exhibition, Decadence of the - - - - 145
Exhibition, the Toronto Industrial vii, No. 7, 157, 167
Elevators Safety of - - - - - - 181
Excavating, Necessity of Care in - - - 185
Examination for Architects - - - - 60
English Cathedrals, Early - - - - 199

Fire Escapes for Public Buildings, the Necessity for - - - - - - - 3
Fire Escapes Act - - - - - - 13
Fire Loss, How to Reduce the - - - - 25
Fire Blinds, Tests of - - - - - 25
Fire Escapes - - - - - - - 5
Fire Loss in Building, Reducing the - 52, 53, 54
Fire Resisting Materials, Relative Value of - 12
Factories Outside of Cities - - - - 135
Fire Escapes - - - - - vii No. 7
Fireproof Construction, Inducement to - - 10
Fire Prevention - - - - - - 174
Floors, Method of Designating - - - 181
Factories, the Designing of - - - - 182
Factory Buildings a Ple for Attractive - - 111
Fireproof Floor, Test of a - - - - 166
Fresco Painting in Italy - - - - 190

Great Britain, Commercial Position of - - 51
Glasgow Exhibition, Decorations of the Grand Dome - - - - - - - 73
Gasoline Torch, Use of and Fire Insurance - 90
Glasgow Exhibition, The - - - - - 91
Gas on Asphalt, Injurious Effects of - - 115
Gas, Acetylene - - - - - - 159
Galbraith, Prof., Complimentary Dinner to - 9

Heating Method in Relation to Health and Economy - - - - - - - 53
Housing of the Poor - - - - - - 59
Heating Methods - - - - - - - 182
Heating Apparatus, Export Conditions Affecting 196

Ironwork, Classic - - - - - - 13
Insurance Rates in Relation to Risk - - 159

Inspection of Building Works, Importance of Proper - - - - - - - 193
Hôtel, New, Toronto - - - - - 58
Heating, a New Idea in - - - - - 79
Hanging Paper on Ceilings - - - - 144
Hardware, Cheap - - - - - - 165

King Alfred an Architect - - - - 179

Legal - - 19, 106, 110, 126, 167, x-No. 10
Limestones, Canadian, Composition of - - 64
Lightning, Protection of Buildings from - 89, 160
Legal, An Interesting Point - - - - 90
L'Art, Nouveau - - - - - - 145
Library Public for Montreal - - - x-No. 8
Lighting for Houses, Methods of - - - 11
Landscape Architecture - - - - 77, 78
Legal - - - - - - - - 100
Licensing of Architects in California - - 164

Manual Training Schools - - - - 3
Montreal Correspondence - - 4, 61, 62, 92, 119
Masonry and Brickwork, Tests of - - - 13
Manufactures and Materials - - - 15, 72, 127
Manitoba Correspondence - - - 96, 97 173
Master Plumbers' Convention - - - 125
Muskoka, the Development of - - - - 158
Measuring Round Timber - - - - 159
Materials Building and Clay Products - - 102
Montreal Builders' Exchange - - - xiv-No. 11
Montreal Correspondence - - - - 141
Municipal Improvements - - - - 100

New Century, Welcoming the - - - - 5
Niagara, to Straighten - - - - - 135
National Association of Master Plumbers' and Steamfitters - - - - - 139 140
Northwest Correspondence - - - - 207
Notes 65, v No. 3, 117, 131, 161, 172, viii-No. 10, 124, 166, 190, 200 xii No. 1,
N.S.W. Industrial Arbitration Act - - 193

O.A.A., Educational Work of - - - - 2
Ontario Association of Architects - 26, 85, 16, 185
Obituary - - - - - - vii No. 11
Ontario Association of Architects - 9 122, 166, 178
O. A. A. Proceedings of Annual Convention 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47
O. A. A. Convention - - - - - 199
Organ Chambers and Cases - - - - 197

Plumbing in Toronto - - - - - 20
Province of Quebec Association of Architects - 31
Paris Exhibition, Financial Results of - - 49
Personal - - - 5, 58, 109, 124, 174, 191
Prefe ential Tariff and Transportation - - 74
Plumbers' Wages in Toronto - - - v No. 4
Plumbing By-Law, Montreal - - 137, 138, 159
Prices and Materials on Building, Effect of - 157
Publications - - - - - 167, 191
Pan-American, Can. Exhibit at - - - 169
Pan-American, Notes from the - - 170, 171
Plastered Walls, Stopping Suction in - x No. 11
Paris Colonial Building at - - - - 100
Pan-American Exhibition, Art Exhibit The - 165
Projections, Unsafe - - - - - 188
P.Q.A.A. - - - - - - - 199

Royal Canadian Academy of Arts, 22nd Annual Convention of - - - - - 92
R. C. A. Exhibition, Architecture at the - vi, No. 5
Roof Gardens - - - - - - 134
Royal Visit, The - - - - - - 169
Recesses in Rooms - - - - xi, No. xi
Ruskin, Mr., and Architecture - - - 200

Sydney, C. B., Building Matters in - - 8
Sewer Gas upon Health, Effect of - - 26
St. Paul's Church, Hamilton - - - - 27
Students' Department - - 30, 31, 37, 55, 81, 89, 9, 156, 178, vii, No. xi, 202
Seven Notable Bridges - - - - vi, No. 2
Supplies for South Africa - - - - 49
School of Practical Science - - - 49, 73
Soft Steel and Wrought Iron, the Corrosion of - 79
Sash Cord - - - - - - - 109
Strikes, Evil of - - - - - - 113
S. P. S. Building, the New - - - 114, 134
Schedule of Fees, New German - - - 115
Sand Grains, the Character of - - - 117
Sandpaper, American Substitute for - - 126
Speculation, Stock, Effect of on Building - 193
Stone, Machine Cut vs. Hand Cut - vii, No. 7
Statue Victorian, Site of the - - - 145
Structures, the danger of putting to new uses - - - - - - viii, No. 8
St. Paul's Cathedral in Danger - - - 161
Sun Rooms on Roofs - - - - xiv, No. 9
Season, A Prosperous - - - - - 172
Steel Structures, Preservation of - - 186
Stained Glass Windows, Process of Manufacture of - - - - - - 191
Stone Barometer - - - - xiv, No. 11
Students' Department - - - - 12, 193
Summer Cottage and its Furnishing - - - 17
Skyline - - - - - - 97, 98 99
School of Science, Suggested Competition for - 100
Salle des Fetes - - - - - - 124
Sewage Disposal in Summer Resorts - 75, 176
Steel v. Cast-Iron Stanchions - - - 188

Temperature of Air, Heat Required to Raise the - - - - - - - 18
Tower of London, Desecration of the - vi-No. 1
Toronto Architectural Eighteen Club 25, 29, 112, 166
Toronto, Beautifying - - - - - 113
Toronto Hotel, the New - - - - 130
Toronto Engineers' Club viii-No. 9, 185, 177
Toronto Technical School - - - - 194
University Building, The Story of a 152, 153, 154
Useful Hints - - - - - - 16

Varnishing Failures, Causes of - - - 89

Wages in Toronto, Agreement as to - - v-No. 5
Wall Paper, Relation to Disease - - 126
Wood, Non-Inflammable - - - v-No. 7
Windows, Stone - - - - xiv No. 9
Wiring, Office Building - - - - 172
Workmen's Compensation Acts - - 181
Window Glass Monopoly - - x No. 12

ILLUSTRATIONS IN TEXT.

Baker, F. S., Toronto - - - - 32
Bridge and Planting Well Combined - - 82

Cottage, Working Plans for - - - 16, 17
Chapel, St. James' Cemetery, Toronto - - 31
Country House, Design for a small - - 67

Dwelling, Moderate Cost Suburban, Working Drawings for - - - - 94, 95
Dwelling House, Prussia, Saxony - - 170

Glasgow Exhibition, Canadian and Russian Pavilions at the - - - - 132, 147

Helliwell, Mr. Grant, Toronto - - - 26
Houses, Small Suburban - - - - 118

Japan Ivy on Piers, Destroying Form and Proportion - - - - - - 81

Keating, Mr. E. H., Toronto - - - 28

Maritime Clay Works, Pugwash, N.S. 63
McGill University—Room in the Architectural Dept. and Drawing Room and Carpenter Shop - - - - 163, 164

Ontario Association of Architects, Rooms of the - - - - - - 52, 53

Porch of a City House (A. & B. Competition) 30
Porch of Canada Company's Building, Toronto - - - - - - - 60
Pan-American Exposition—
U.S. Government Building - - 78
Canadian Pavilion at - - - 165
Canadian Art Exhibit - - 178, ix

Residence of Mr. G. A. Reid, Toronto - 57
St. Paul's Church, Hamilton - - - 27
Summer Cottage, Toronto Island - - 79

University of Toronto—Group of Carvers 153, 154

Vestibule, A, (A and B Competition) - 55

ILLUSTRATIONS.

Bungalow, Victoria, B.C. - - - No. X
Bank of Commerce, Exterior and Interior Views - - - - - No. XII

College, Design for - - - - No. II
Canadian Bank of Commerce, Toronto - No. V
Cathedral at Ferrara, Italy, Facade of - No. IV
Canadian Bank of Commerce, Winnipeg. No. XI

Designs of Small Houses and Cottages No. IV
Dominion Bank, Winnipeg, Man. - No. X

Franciscan Church, Quebec, Interior of No. III
Fine Art Galleries, Glasgow, Scotland - No. IX
Fire Place - - - - - No. XII

Glasgow Exhibition Buildings - - No. V
Government House, Victoria, Competitive Design for - - - - - No. VII

House on Albany Avenue, Toronto - No. VIII
House on Huron Street, Toronto - No. XI

Kirby Hall, England - No. VIII, IX, X, XI

Library Building, Westmount, Que., Carving on - - - - - No. X
Loretto Abbey, Toronto, Interior of Chapel - - - - - No. V

Moderate Cost House, Design for - No. III
Manufacturers' Arch, Toronto, preferred designs on Competition for a - No. VIII
Moderate Cost House in Toronto - No. XI
Montacute House, England - - No. XII

Office Building of E. B. Eddy & Co., Hull, Que - - - - - No. I

Pan-American Exhibition Buildings, Statuary for the - - - - No. IV

Residence of Lewis Skaife, Westmount, Que - - - - - - No. II
Rushton Hall, England - - - - No. III
Residence of J. D. St. Denis Lemoine, Ottawa, Ont. - - - - No. IV
Residence in British Columbia, Design for No. VI
Residence of Charles F. Wagner, Toronto No. V
Residence of C. J. McCauig, Montreal No. VII
Residence of Mr. E. B. Eddy, Hull, Que. No. IX
Residence of Mr. W. P. Gundy, Toronto No. IX
Residence in Rosedale, Toronto - No. XI

St. Paul's Church, Hamilton - - No. II
Summer Cottage and its Furnishings No. III
Stained Glass Designed and Executed by H. Bloomfield & Son, Vancouver, B.C. No. IV
Sal des Fetes, Proposed - - - No. VI
St. George's Cathedral, Kingston, Ont. No. V

Toronto Bible Training School - - No. I
Tomb of Abbots—John, Martin and Andrew, in South Choir Aisle of Peterboro Cathedral, England - - No. II
Toronto Hotel, Accepted Design for Proposed - - - - - No. III
Town Hall, Windsor, N.S. - - - No. XI

The Canadian Architect and Builder

VOL XIV—No 158 FEBRUARY, 1901

ILLUSTRATIONS ON SHEETS.

Residence for Mr. Louis Skaife, Westmount, Montreal—McVicar & Heriot,, Architects.
Tomb of Abbots, John, Martin and Andrew in South Choir Aisle of Peterborough Cathedral, England. Measured and Drawn by Eden Smith.

ILLUSTRATIONS IN TEXT.

Canadian Architect and Builder Students' Competition for Porch—First Prize Design by Willford A. Gagnon.
Chapel of St. James' Cemetery, Toronto (Toronto Architectural Eighteen Club Competition in rendering from Photo), First Prize, Hector A. Payne, Toronto.
Portrait of Mr. Grant Helliwell, President Ontario Association of Architects.
" " F. S. Baker, F.R.I.B.A., 1st Vice-President Ontario Association of Architects.
" " Mr. E. H. Keating, President Canadian Society Civil Engineers.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Photogravure Plates—Exterior and Interior of St. Paul's Church, Hamilton, Ont.

CONTENTS.

The A. I. A. 25
Effects of Sewer Gas Upon Health 25
How to Reduce the Fire Loss 25
The O. A. A. 25
The Toronto Architectural Eighteen Club 26
Tests of Fire Blinds 26
An Art Museum as a Memorial to Queen Victoria 26
St. Paul's Church, Hamilton 27-28
Canadian Society of Civil Engineers 28
Description of Residence for Lewis Skaife 28
Toronto Architectural Eighteen Club Exhibition 29
Students' Department 30-31
Province of Quebec Association of Architects 32
Ontario Association of Architects Convention 32-47

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" FREDERICK G. TODD, Landscape Architect, Montreal.
" R. A. L. GRAY, Electrical Engineer, Toronto.
" W. H. ELLIOTT, of Messrs. Elliott & Son Co., Toronto.
" J. C. B. HORWOOD, Architect, Toronto.

IN COMMON WITH LOYAL SUBJECTS OF THE EMPIRE THROUGHOUT THE WORLD WE DEEPLY DEPLORE THE LOSS OF THE GRACIOUS SOVEREIGN WHOSE LONG AND GLORIOUS REIGN CAME TO A CLOSE AT OSBORNE PALACE ON JANUARY 22ND, 1901. "SHE WROUGHT HER PEOPLE LASTING GOOD."

The A. I. A.

THE next convention of the American Institute of Architects will be held at Buffalo, during the Pan-American Exhibition. The choice of a meeting place seems a wise one, for outside of its own attractiveness, the city of Buffalo will have a wealth of architectural features to show in its Exhibition.

The Toronto Architectural Eighteen Club.

THE Club are to be congratulated upon the success of the exhibition of architectural drawings held under their management in Toronto last month, an extended notice of which appears in another part of this issue. Several months of earnest effort were required to perfect the arrangements for this exhibition. The expenses were met by the revenue derived from advertisements in the exhibition catalogue, the compilation and publication of which also involved much labor. The number of visitors to the exhibition was large and would no doubt have been greater but for the death of the Queen. The public lecture by Mr. Albert Kelsey, of Philadelphia, on methods of beautifying towns and cities, brought together a good audience, and was much appreciated. The exhibition has undoubtedly proved a stimulus to local architects and directed public attention to the subject of architecture—results which in themselves are important.

How to Reduce the Fire Loss.

THE recent great fire in Montreal and the consequent heavy increase in insurance rates, should not only lead to the perfecting of fire brigades and equipment, but, on the principle that prevention is better than cure, should direct public attention to the value of fire resisting materials in building construction. The Japanese Government has recognized the wisdom of such action, by giving an order to a United States manufacturer for 80,000 feet of wire glass to be used as a fire-resistant in the Imperial Japanese navy buildings at Mai Juru. The value of properly constructed division walls as a means of preventing the spread of fire within a building was well illustrated at the recent fire in the store of Marshall Field & Co., in Chicago, where by such walls the fire was confined to one section and the loss was only $25,000.

Tests of Fire Blinds.

THERE has recently come to hand a report of a test conducted last year by the British Fire Prevention Committee with fire-resisting curtains and blinds. The object of the test was to show the protection against fire afforded to a window and to a door of 20 superficial feet and 16 superficial feet area respectively, when screened from

the flames by rolling fire blinds which can be put into position in a few seconds. The test of the fire was within three feet of the face of the fire blinds, which were subjected to a temperature gradually increasing from 400° to 1600°. The blinds after 30 minutes test remained in position, the fire not having penetrated through the door or window. The test seems to show that by means of properly constructed and adjusted fire blinds the entrance of fire through windows and doors may be retarded for a time, thereby giving opportunity for the arrival of the firemen. A matter of much importance is the facilities for speedily placing the blinds in position under the most disadvantageous circumstances which could be induced by an attack of fire.

The O. A. A.

THE annual convention of the Ontario Association of Architects, held in Toronto last month, the proceedings of which are printed in this number, was one of the most interesting in the history of that organization, and likely to be productive of lasting results. It was decided to proceed at once to establish a system of instruction for students, based upon the course of study recommended in the report of the Committee on Education. The Association will memoralize the Dominion Government to throw open to competition among architects in private practice the designing of important public buildings, a system which was adopted several years ago by the United States Government, and which has worked out very satisfactorily. The adoption of the system in Canada would stimulate our architects to the exercise of their highest skill, and lead to the erection of public buildings throughout the country which would not only be carefully adapted to their requirements, but would stand as examples of refined architecture. The convention papers were of a high order of merit, and evoked interesting and instructive discussion.

MR. GRANT HELLIWELL,
President Ontario Association of Architects.

Effects of Sewer Gas Upon Health.

IT is gratifying to learn that the Medical Health Officer of Toronto is conducting an investigation to determine if possible what relation the out-flow of sewer gas from the ventilators at the street level has upon the spread of diphtheria. The noxious vapours arising from these ventilators, especially in winter when the atmosphere in the sewer is at a higher temperature than outside, have been the subject of much comment, and have been regarded by many citizens as a source of serious danger to health, and as being at least one of the causes of the prevalence of diphtheria among children. The evil is specially noticeable in the northern part of Toronto, where many of the sewers have dead ends. This section being at the highest altitude, the sewer gas from the lower districts of the city naturally rises to and finds an outlet there. The result of the investigation which is now being held will be looked for with much interest, and it is to be hoped will determine approximately at least the extent to which these ventilators are the cause of disease.

An Art Museum as a Memorial to Queen Victoria.

SINCE the death of Queen Victoria, the subject of a suitable memorial to her memory has been under discussion in Toronto. The Provincial Government has signified its intention to contribute at least $10,000 towards this object. The Premier has stated it as his opinion that the memorial sheuld take the form of an Art Museum. This opinion, we believe, will be shared by a large number of the citizens. Indeed, a movement having for its object the erection of a museum of this character was begun about a year ago by a number of public spirited citizens, and a considerable sum has already been raised by private subscription towards the carrying out of the project. It is gratifying to learn that the Government are in sympathy with the undertaking, and it is to be hoped that the proposed grant from the Legislature will be given to assist it. Queen Victoria's reign was marked by a wonderful advancement in the arts and sciences, to which advancement her liberal encouragement was at all times given. A memorial of the character referred to would therefore seem to be a particularly fitting one. Toronto has now reached a position where an institution of this kind should be established. There are few cities of equal importance, especially from an educational standpoint, in which a home of the arts does not exist. The Ontario Association of Architects, in convention assembled, passed a resolution approving of the views expressed by the Premier of Ontario with regard to this matter. Application is to be made for incorporation by an Association to be known as the "Art Museum of Toronto," and a public meeting of citizens is to be held at an early date to consider and promote its establishment. If it should be decided to give it the character of a memorial to our late Queen, public interest in behalf of the undertaking would no doubt be stimulated, and the probability of the success of the movement enhanced.

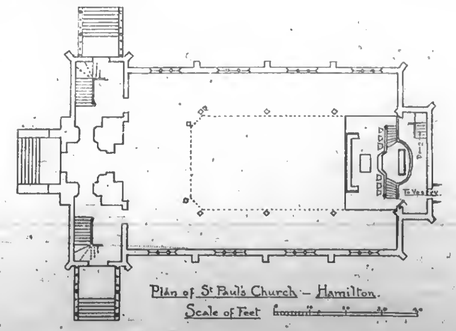
ST. PAUL'S CHURCH, HAMILTON, ONT.

The city of Hamilton possesses in St. Paul's a church which is well worth the study of architects. The present fine building is old, as the age of buildings goes in Ontario, but the parish is older still, its history reaching back to 1833 when Hamilton was a village with a population of less than a thousand. In 1833 a Presbyterian minister was first called to officiate regularly in Hamilton, and a small frame building on the site of the present church was built by his congregation and called St. Andrew's church. The founders of the parish lie in the churchyard, but they never saw the beautiful church which now protects their graves. Their headstones, inscribed in each case to the memory of a native of some county in Scotland, show that they went to their rest in the thirties and forties of the past century, whereas the present church was not built until 1857. But if the fathers of the church saw nothing of its present beauty they saw nothing also of the troubles that came upon the parish, beginning with the disruption of 1843 in Scotland which made its way to Canada in the following year. The congregation was first divided over this question, the minister leading off a portion to found a church representing the Free Church of Scotland. About ten years afterwards a second trouble began when the old church of St. Andrews was moved to another site in order to make room for a new building, which was begun in 1855 and opened for worship in 1857. Unfortunately for their peace, though fortunately for succeeding generations, the congregation overestimated their resources and undertook the erection of a more costly structure than they could finance. Though they raised the handsome sum of $30,000 there still remained a debt of about the same amount, and circumstances arose in connection with this heavy burden which led to the closing of the church for a time. Many members worshipped with neighboring congregations, while others built a brick church retaining the name of St. Andrew and the services of their minister. Thus it came about that when in 1876 there was an amalgamation of the divided congregation forming a body to resume worship in the new church it was found necessary to give up the name St. Andrew's to those who continued to worship in the brick church. and to call the new church St. Paul's. But the bell which called the new congregation together for its first service was the old bell of St. Andrew's, the oldest bell in Hamilton, which still hangs in the tower of St. Paul's church.

ENTRANCE TO ST. PAUL'S CHURCH, HAMILTON.

The building was designed by William Thomas, of Toronto. It is of course a product of the Gothic revival and one of the better class of such products, in which an essential part of the aim was honest work. The construction is genuine; the spire is of stone throughout. As is often the case economy supervened when it came to the renewable appendages of porch and steps. These were originally all built of wood, but the front steps have been recently converted to stone and the porches will no doubt follow some day. This will be a great improvement, for not only is wood too mean a material for the entrances of so fine a church, but, as there was no attempt made to imitate the proportions of stone in the wooden porches, their slender design is somewhat too light for the substantial character of the main building.

The walls are of gray Hamilton stone backed by lake shore stone, which in the interior of the spire seems piled very high for such rough material. The details are well designed and well executed. The spire is truly elegant; the pinnacles which finish the tower have the appearance so common in this type of spire of needing unification, but they accomplish the purpose of enrichment for which they were intended. The crocketted gables over the belfry windows have an admirable effect of enrichment, and the spire is a model of well balanced ornament; with a band and dormers near the bottom to combine with tower and pinnacles, and just one well placed repetition of it near the top to give the eye a resting place which divides the spire in pleasant proportions into the beginning, middle and end which every composition should have. It is interesting to observe by blotting out this upper band with the finger how uncomposed the spire is without it and how impossible it is to get the same effect of repose if the band is moved at all, either up or down.



Plan of St Paul's Church – Hamilton.
Scale of Feet

It is a pity that the traceried window under the belfry is there at all. It does not look into the church as its size and ornate character would lead one to believe, but upon a passage way into the belfry. For this a very small window would have served and it would have

been better to have taken advantage of the facts so as to keep the wall plain at this point and increase both the size and richness of the entrance below which is now too small and too plain.

The gallery stairs give an opportunity for side gables to stop the slope of the roof which has usually such an unpleasant effect in combination with a spire.

The external defect of the church is want of length in the body, but an examination of the interior shows how this came to be. It is the gallery that provides lines for the interior proportion and on the inside proportion is satisfactory. There is no doubt the church would be a finer church without the side galleries, but if these galleries were to be taken down without at the same time lengthening the church the apparent width of the church in proportion to its length would probably be greater than the eye can guess in anticipation while under the influence of the present arrangement which is carefully composed. The pulpit is the centre of attention, and is given the importance which it should have and which it is so hard to give it when it stands alone, by placing it under the arch of a spacious recess. This arch spans the whole distance between the gallery fronts, with the effect of dividing the body of the church into a central portion with wings. Even above the galleries, although the roof is a clear span, to some extent the central portion governs the eye in estimating the proportions of the church, for the gallery fronts are a strong line running to the springing of the arch over the pulpit and meeting the top of the carved screen that backs up the pulpit and forms the tying line of the arch.

The treatment of the pulpit is admirable. The actual desk upon which the preacher rests his books is but a small point in the space at the end of the church, but the full spread of the steps which extend on either side has been utilized by enclosing them with a horizontal rail to increase the width of the pulpit and its platform to the utmost. What is lacking is made up by the screen behind which spreads across the whole width of the space under the arch, a distance of nearly 30 feet. The screen might well have been higher in the centre behind the minister in which case it would have served to blot out the lower part of the window behind and prevent the minister's head appearing en silhouette to the occupants of the front seats. The window in the recess is in fact not an altogether happy feature, not only for this reason but because of the conflict of its lines with those of the arch. It is impossible to desert the springing line of the arch as a basis in designing the window. It is a difficult situation but with the help of tracery it should not be impossible to make a satisfactory combination of screen and window.

The screen is of course closed in at top and the space behind forms a passage way to the vestry and cellar.

The roof is eminently satisfactory. It has pointed trusses, purlins, rafters and ceiling boards all of dark oak. There are dormer windows on each side, an addition to the original design, which, though they are rather poor in external detail have an excellent effect inside. The light shining in between the trusses increases the vigor while relieving the gloom of the roof and the dark colour of the roof matched by that of the seating below gives a fine breadth of effect in colour.

These are the main points that attract attention in a first visit to the church, but it has an attractiveness that increases with attention and forms a wholesome example in a country where there is more temptation to over freedom than to pedantry, of the merits of scholarly work.

CANADIAN SOCIETY OF CIVIL ENGINEERS.

The annual meeting of the Society was held in Montreal on Jan. 25th, when the following officers were elected: President, E. H. Keating, Toronto; vice-presidents, Messrs. G. H. Duggan and E. Marceau, Montreal; and C. H. Rust, Toronto; treasurer, H. Irwin, Montreal; secretary, Prof. C. H. McLeod, Montreal; librarian, W. H. Rice Roberts, Montreal; council, Messrs. J. Kennedy, Montreal; W. P. Anderson and G. H. Mountain, Ottawa; D. MacPherson, Montreal; P. S. Archibald, Moncton; H. J. Cambrie, Victoria, B.C.; W. R. Butler, Kingston; J. Galbraith, Toronto; James Ross, Montreal; H. S. Poole, Stellarton, N.S.; R. B. Rogers, Peterborough; R. Hering, New York; W. Chipman, Toronto; B. McConnell, Montreal; and C. B. Smith, Toronto.

MR. E. H. KEATING,
President Canadian Society Civil Engineers.

ILLUSTRATIONS.

RESIDENCE FOR MR. LEWIS SKAIFE AT WESTMOUNT, P. Q.—MACVICAR & HERIOT, ARCHITECTS.

The foundation walls are of limestone and the walls above base course are in red brick laid up with white mortar. The house is designed in "Old Colonial" style with woodwork of cornices, portico, and verandahs finished in white.

Entrance is obtained by wide flight of steps leading up to doric portico with columns on each side. The inner vestibule opens into a wide staircase hall with sliding doors giving access to drawingroom, diningroom and library. The broad staircase leading up to first floor will be finished in white and mahogany with oak treads and floors.

The kitchen is on ground floor with butler's pantry off dining room. A back staircase leads up to the first floor from pantry. The upper floors are arranged for bebrooms, nursery, large hall, sitting rooms, bath rooms, etc. The mantelpieces are designed in the Colonial style and the one in library is built of brick. The basement is utilized for workshop, heating apparatus laundry, etc. The heating is by hot water and the plumbing throughout is of the very latest style.

THE TORONTO ARCHITECTURAL EIGHTEEN CLUB EXHIBITION.

The exhibition of drawings belonging to the circuit of exhibitions of the Architectural League of America, which was obtained for Toronto by the association of the Toronto Architectural Eighteen Club with the League, has been an event in architectural circles in Toronto; and it is gratifying to learn that this is but the first of a series of such exhibitions.

We must however recognize that the exhibition was essentially an exhibition of drawing. It was the rendering that attracted attention principally, and was the principal field of effort on the part of the draughtsman. As such it was useful. Our own architects have not made a study of rendering as was evident from many of their exhibited works, and there is no doubt that this exhibition could give them some useful hints in the art of making attractive drawings. But it is well to enquire how far the art of making attractive drawings is helpful to the art of architecture. The real architectural drawing is of course the line drawing which marks the limit of surfaces only in order to define them for the purpose of measurement. Any other kind of drawing must be made either to help the architect to see his design in its perspective projection, or to represent to the owner the appearance of the executed work. The latter use has become a disease—a parasite that has fastened itself upon the profession, largely due to the profession's own eagerness to expose its wares. From the owner's point of view the practice is desirable, and in commercial ventures the profit in the new building often begins as soon as the design is made and a perspective can be furnished, for publication by lithography as an advertisement. The more realistic the representation and the more people going in and out of the door the better. But such drawings ought not to be called architectural drawings and there is no reason why they should be made by architects; indeed in the more lavish architectural circles they are done outside the office by specialists. The architects own work in the way of perspective and freehand drawing is done long before the design has reached the stage from which these finished drawings are made. The elevation is not the source of his studies but their product. By the time he has made up his mind enough to decide upon all points of his the elevation and completed the drawing of it his work on the drawing board is done; the rest is building.

For the purpose of this kind of tentative study the first essential is severe truthfulness. The motive of the drawing is the detection of faults; its purpose is not to show off the design but to show it up. Any kind of cooking, whether of the perspective or in the less bare-faced falsities of cloud shadows, improbable foliage, unrealizable beauty of colour, or a chic handling that is a ground of pleasure in itself is out of the question unless the designer wishes his studies to minister to self deception. On this ground Mr. Wilson Eyre, the genius of the exhibition, would be ruled out for the most part of his work. His drawings are works in themselves, and if the owner's right to the possession of drawings were to be established by the courts he would get in one of these preliminary sketches (if they are preliminary sketches) a possession for which the whole fee of one per cent. for preliminary drawings would sometimes be little enough. Mr. Eyre might, however, plead with justice that they are not architectural drawings but were made for his own gratification. They are in truth little pictorial creations founded upon his designs. Mr. Goodhue, Mr. D. A. Gregg and other skilful draughtsmen show their buildings by a drier light than Mr. Wilson Eyre does, but the excellence of the drawing too often consists in qualities of abstraction, colour and technique which would prove dangerous in a drawing intended for the scientific observation of a design by the designer. They are not therefore architectural drawings of the best type in spite of their excellences. A better model was the bird's eye view of the Pan-American exhibition sent by Messrs. Carriere and Hastings. This drawing had qualities of delicacy and clear modelling that gave it rank among the beauties of the exhibition, but its motive was a clear statement of the facts. This, the only motive that is reasonable in a purely architectural drawing, is not inconsistent with beauty, and as far as technical pleasure goes, to those who know the skill and knowledge required for its perfection, there is quite as much technical pleasure to be derived from its precise beauty as from the pictorial and decorative effects which a freer style accepts from accidents of material.

It may seem impertinent to speak of architectural drawing as a thing outside of the Beaux Arts rendering which is architectural rendering par excellence in the sense that the style is evolved from the theme and is exactly suitable for its expression. But herein lies its unsuitability for other themes, and all architecture has not the ideal conditions of that which is commissioned in the Beaux Arts schools and studios for a more splendid civilization in a better land than ours. That land of white marble colonnades with a backing of soft blue foliage is a land to dream of and to hope to go to when we die; but here, alas, white marble is not, and the trees are only green.

Yet it is from such a training as the students of the the University of Pennsylvania are receiving, who in this exhibition play like young Raphaels with the classic forms and make such beautiful drawings of their designs, that the best results may be expected not so soon however as would appear from the truly astounding skill they seem to display. Art is long. The law knows no change and respects no system, for art is not that which is planted in the mind but that which grows in it by the slow process of individual growth. But the result is all the greater for the enlargement of the mind in which the process of incubation is going on, and one great source of enlargement is facility in drawing. To have the drawing eye is to have the seeing eye which both consciously and unconsciously feeds the mind continually. If the interest in drawing which this exhibition has created does not die away without stimulating some of our younger architects to practice with the pencil and brush it will have done good service in Toronto.

Mr. Frederick G. Todd, landscape architect, of Montreal, whose office was in the Board of Trade building, lost a valuable collection of plans, books, etc., by the fire which destroyed that building last month. Mr. Todd has opened an office in the Bell Telephone building.

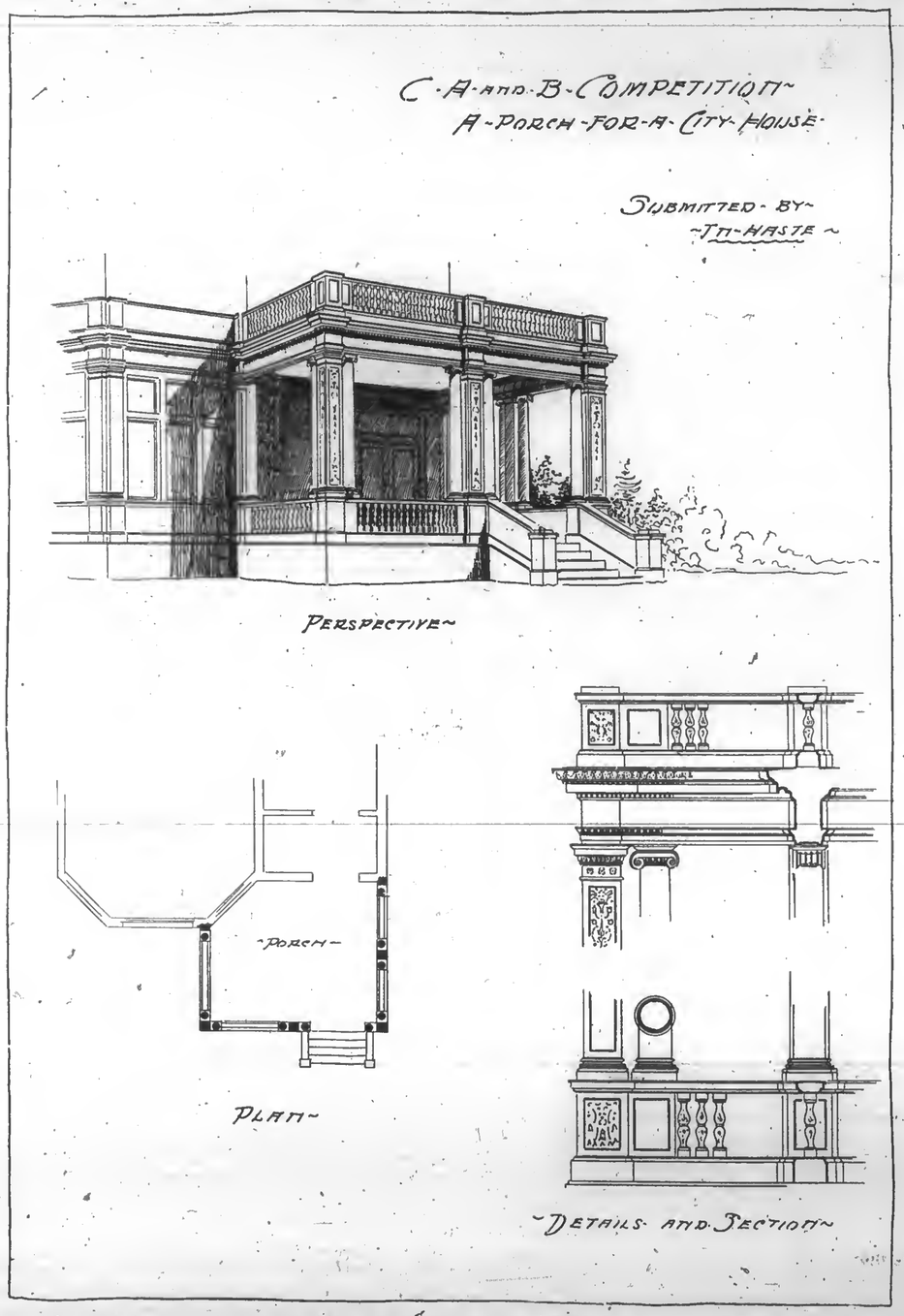
A book on "Bricklaying" by Owen B. McGinnis, of 810 West 128th street, New York, has just been published. It has been compiled from a series of articles on the subject contributed by the author to the professional and trade journals. The price of the book is not stated.

Mr. W. B. Hamilton, who for the past twenty-five years has been connected with the St. Lawrence Foundry (now the Canada Foundry), of Toronto, has severed his connection therewith, and has been appointed Western representative for Messrs. Drummond McCall Company, of Montreal. He is now located at 93 York street, Toronto.

STUDENTS' DEPARTMENT.

CANADIAN ARCHITECT AND BUILDER STUDENTS' COMPETITIONS.

The committee appointed, by the Ontario Association of Architects to judge the merits of the designs submitted in these competitions have reported as follows:—



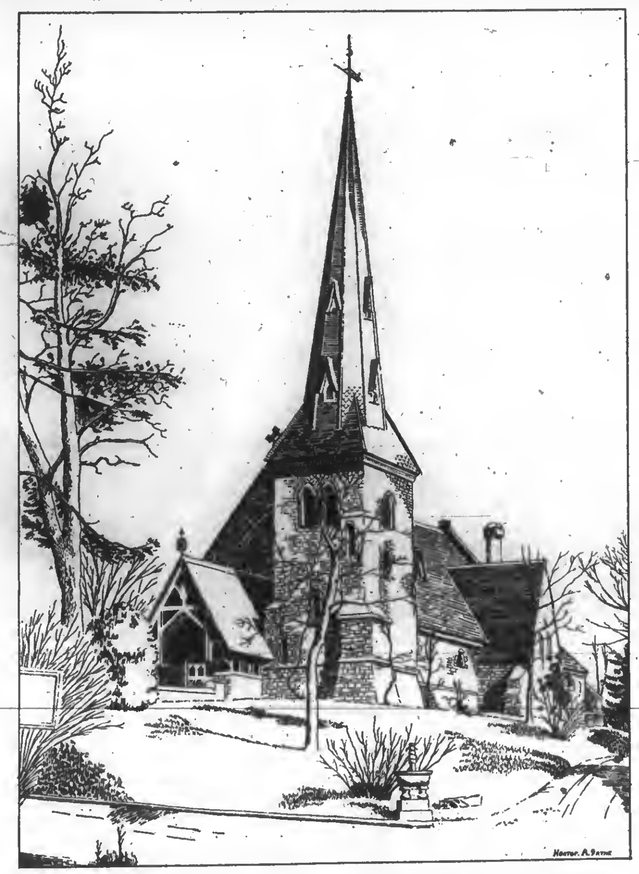
CANADIAN ARCHITECT AND BUILDER STUDENTS' COMPETITION FOR A PORCH FOR A CITY HOUSE—DESIGN BY "IN HASTE" (MR. WILLMOTT GAGNON, MONTREAL), AWARDED FIRST PLACE.

COMPETITION FOR VESTIBULE

"Victor" is placed first. This is a very commendable design in Italian Renaissance. The disposition of the somewhat luxurious features of its design, the plan, heights of doors, impost mouldings, etc., are correctly worked out in their relation to each other. We think the author is to be commended for having taken good advantage of the fact that there was no limit of cost, of having placed the problem on a high plane necessitating research and study, with corresponding benefit to himself. The rendering is clear, and displays good draughtsmanship throughout.

"Torch and Wreath" is placed second. This is a satisfactory, though not strikingly original "Old Colonial" doorway and vestibule. Its various details are of good type, though the lead work of fanlight of outer door is hardly in the spirit of the style. More light should certainly be provided in this vestibule, and this might be done by placing a window in one of the side walls. The rendering is good but a little shaky and uncertain in places.

"Drawing Pen".—We place the design marked by a drawing pen third, but must say, we had difficulty in deciding between it and "Jack," they being about equal in design and rendering, and having the same faults, a little too much elaboration, over panelling, etc. "Drawing Pen's" front door we consider better than "Jack's," the single panel in width being more suitable to such a door than the double one shown in the latter's design. The small window shown in section at line of capping of wainscotting would, we think, be better either larger or at least placed free from wainscotting, in which case the trim could be made as indicated in the elevation. Rendering is carefully done, and the sheet is nicely arranged, but we think it would be better if the author had taken the two pages permitted by the conditions to show his design.



CHAPEL ST. JAMES' CEMETERY, TORONTO.—(TORONTO ARCHITECTURAL EIGHTEEN CLUB JUNIOR COMPETITION IN RENDERING FROM PHOTO.) FIRST PRIZE, HECTOR A. PAYNE, TORONTO.

"Jack."—This drawing, which we place fourth, is referred to above. Its general defect, both in design and rendering is "fussiness". The head-piece of interior door and window casings would be much better if higher, and so arranged that the picture mould would mitre with its cornice mould or at least stop against it.

"Check" and "Plus".—Of the two last designs, that signed "Check" is somewhat the better, but neither esigner seems to have taken the problem seriously, either from inexperience or lack of industry, and both have overlooked the fact that the competition was for a complete vestibule.

[The names of the successful competitors in the competition for vestibule are: "Victor," (Mr. Willford A. Gagnon, 590 Temple building, Montreal,) awarded first position; "Torch and Wreath," (Mr. George C. Egg, 24 Tupper Street, Montreal), awarded 2nd position; "Drawing Pen," (Mr. Wm. G. Murray, Albion Building, London, Ont.,) awarded third position.—EDITOR C. A. & B.]

COMPETITION FOR PORCH.

"In Haste."—This is evidently intended for a stone porch. For a porch of its pretensions, the foundation looks altogether inadequate, and should have had plinth and cap moulding. The balustrade over cornice is too heavy, the introduction of the panels flanking the posts increasing this defect. The parapets of steps lack grace, through want of proper ramps and want of thought in design of pedestals. The rendering of section shows some care, but the plan and perspective are evidently hurried work. The projection of the shadows in latter are incorrect and line work unsatisfactory. Although we place the design first, we think it is to be regretted that the author did not devote more time to its perfection.

"Gains" is placed second, as the design, while rather that of a verandah than that of a porch, shows a good knowledge, both of construction and design. The scheme of the heavy projecting eaves, and the general simplicity of outline and detail, are commendable. As the frieze would of necessity be "built up" the arched soffit would be unsatisfactory and would seem to be an attempt to get the effect of stone in a wood construction. The rendering has little character and indicates lack of practice, the tree and foreground being very scratchy.

"Dodeka," who is given third place, shows a plan which is original but hardly commendable. The jutting

of vestibule into porch is a serious defect, and takes away from the usefulness of the floor space. The general character of the design is simple and pleasing and shows an appreciation of the natural use of materials employed. It also has a domestic feeling, which is appropriate. The rendering, though somewhat rough and careless, is fairly effective.

"The Imp" shows a cleanly executed drawing, without exhibiting much knowledge of effective line work, particularly in the shadows under porch and the trees in the distance. The plan itself deserves special mention, being probably the best sent in, the steps directly opposite the doorway leaving the octagonal space available for use, without being interrupted by the traffic to the front door.

"Ajacks" (Ajax?)—This plan would be improved by giving more projection in front of house, but is radically defective in that traffic from steps to door leaves balance of floor space of little use. As to design, the idea is good, but not backed up by sufficient display of knowledge of classic details, as shown by omitting abacus of caps in elevation, and although the Ionic order seems intended, the cornice is altogether too radical a departure from accepted forms.

GRANT HELLIWELL
JOHN GEMMELL
A. H. GREGG
} O. A. A. Committee.

[The names of successful competitors in the competition for porch are :—"In Haste" (Mr. Wilfrid A. Gagnon, 509 Temple Building, Montreal), awarded first place ; "Gains," (Mr. D. W. F. Nichols, 28 Toronto street, Toronto), awarded second place ; "Dodeka," Mr. W. F. Sheppard, 28 Toronto street, Toronto), awarded third place.—Editor C. A. & B.]

ORGANIZATION OF STUDENTS.

AT a meeting held a fortnight ago an organization of the architectural students in Toronto was effected, and the following officers appointed : President, D. W. Nicholls ; vice-president, E. H. Russell ; secretary-treasurer, A. M. Weir, 225 Clinton street.

A second meeting was held on the 5th inst., when after disposing of some routine business, the students attended in a body the lecture given by Mr. Kelsey under the auspices of the Toronto Architectural Eighteen Club.

A third meeting was held on the 12th inst., when a small summer cottage was set as the subject for design by the members, Mr. J. P. Hynes acting as critic. At this meeting it was decided that the members would attend and support the studio work under the auspices of the Toronto Architectural Eighteen Club. It was also decided to request the editor of the CANADIAN ARCHITECT AND BUILDER to give greater attention to the Students Column in that publication, and that the club would support any competition for students which might from time to time be conducted by the CANADIAN ARCHITECT AND BUILDER.

A method of keeping track of the names of the colors in a tin color box is to paste upon the flap each of the labels. The colors and labels will bear a relative position to one another. When the case is used this idea is a good one but a better scheme is to paste the label to the pan, then the color tells its own name.

Draughtsmen experience an annoyance sometimes by having their Indian inks upset. This bother may be overcome by making a little wooden stand in which are bored a number of holes comparing with the number of colored inks used.

MR. F. S. BAKER.

Mr. F. S. Baker, first vice-president of the Ontario Association of Architects, has recently been elected a Fellow of the Royal Institute of British Architects. Mr. Baker is the first Canadian to receive this honor.

PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS.

A special general meeting of the Province of Quebec Association of Architects was held last month in the association's rooms, 112 Mansfield street, when several amendments to the by-laws were adopted. The chair was occupied by Mr. Jos. Venne, the vice-president. There were present: Prof. Capper, Messrs. Alcide Chausse, J. S. Archibald, A. H. Lapierre, L. A. Amos, C. Dufort, M. Helbronner, A. C. Hutchison, G. N. Hutchison, Raoul Lacroix, R. P. Lemay, Quebec, J. P. Ouellet, Quebec, George W. Wood, Eugene Payette and Alp. Venne.

Before proceeding to the business of the evening

MR. F. S. BAKER,
First Vice- President Ontario Association of Architects.

this resolution was passed, read by Prof. Capper, all members standing :

Resolved : That the Province of Quebec Association of Architects expresses its deep grief at the sad tidings received of the death of Victoria, Queen and Empress, the beloved sovereign of this Empire, recording its profound sense of the national loss that has befallen all who share in the noble heritage bequeathed to her people by her long and blameless life of beneficient constitutional rule."

The date of the annual meeting was changed from September to January, which was considered to be a more convenient date, as the books of the association are closed on December 31st. The council will meet twice a month, first and third Tuesdays, instead of once, as heretofore. Examinations will take place both in Montreal and Quebec, if there are candidates in each place.

The twenty second annual exhibition of the Royal Canadian Academy of Art will be held in the galleries of the Ontario Society of Architects, Toronto, on April 12th. An effort will be made to send a representative collection of Canadian art to the Pan American Exhibition at Buffalo.

Mr. Richard Dinnis, the well known builder, of Toronto, delivered a lecture on the 8th inst., in the Beverley Street Baptist church in that city, on "Rambles in Italy." The lecture, which was illustrated by stereopticon views, was highly interesting and greatly appreciated.

ONTARIO ASSOCIATION OF ARCHITECTS

PROCEEDINGS OF THE ANNUAL CONVENTION HELD IN THE ROOMS OF THE ASSOCIATION, 94 KING STREET WEST, TORONTO, JANUARY 29TH AND 30TH, 1901.

The following members were present : Mr. A. Frank Wickson, President (in the chair), and Messrs. Grant Helliwell, A. E. Paull, D. B. Dick, M. B. Aylesworth, F. F. Saunders, Robert M. Ogilvie, George W. Gouinlock, Edmund Burke, J. Wilson Gray, John Kay, Laurence Munro, W. Frye Colwill, S. H. Townsend, A. H. Gregg, John Gemmell, W. A. Langton, F. S. Baker, W. R. Gregg, C. H. C. Wright, H. B. Gordon, Mark Hall, W. L. Symons, J. E. Belcher, R. J. Edwards, Alfred E. Boultbee, C. H. Bishop, George R. Harper and Charles F. Wagner.

The proceeedings were opened at 2.30 p.m., Tuesday, 29th, when the minutes of the last meeting were read and approved.

The President : Before taking up the business on the programme there is a resolution to come before us. I think there is no one in this room who has not known what it is to have the Queen as their sovereign ever since they can remember anything. And long as her reign has been there has never been any time or any occasion when we could not feel that it was a privilege to be living under it. While I think there is no thought of sending any communication from us, it has been thought that it would be a good thing if we had a resolution placed on the book referring to the death of our sovereign.

Mr. Dick read the following resolution which was carried by a standing vote in silence :

"That the members of the O.A.A., in convention assembled, desire to place upon record their sense of the great loss which the British Empire and the world have sustained through the death of the illustrious sovereign who, during the lifetime of two generations, occupied the throne of the British Empire, and by her irreproachable personal character, her womanly graciousness and sympathy, her queenly dignity, and her devotion to public duty, adorned her high station, and gave a name to that glorious epoch which has been the greatest in scientific invention and discovery since the beginning of history, and which will be known to all time as "The Victorian Era." They also desire to express their deep sympathy with the members of the royal family in their great personal sorrow for the loss of their beloved head."

The President, Mr. Wickson, then read his address :

PRESIDENT'S ADDRESS.

GENTLEMEN,—The Council of 1900 having bestowed on me the honor of the presidency of the Association, the responsibility has naturally rested on me of preparing and reading the conventional president's address which, by the way, will be somewhat shorter than those of my predecessors, as the registrar is to embody in his report a fuller account of the doings of the Council than has usually been done heretofore, and in addition to this several important committees are to report separately.

The measure of success during the past year, though less perhaps than we aimed at, will be seen to be considerable, and is due mainly to the indefatigable efforts of the various committees, and I desire to take this opportunity of thanking the members of these committees for the loyal manner in which they have stuck to the work entrusted to them, faced all the problems confronting them and assisted the president through the year.

As most of you know the results do not usually indicate the amount of hard work in connection with managing bodies such as councils and committees of a council, for as in the planning of a building, it is so simple—when it's done. The members of this Council as a Council have given much time to the thoughtful consideration of the matters before them in addition to their work on the various committees and sub-committees in connection with it. As an illustration of this we might instance the preparation of our new tariff. The committee appointed to attend to this gave every consideration to it, comparing all sorts of tariffs one with another, and then finally recommended the adoption of the American one in its entirety. We then held two meetings of the Council, each prolonged till well towards midnight, in discussing this report, and only those on the Council will have any idea of the difficulties we met with in the settling of this schedule of professional fees. The size numerically of our country, cities and towns, practically necessitated some changes, and to make these changes suit the members in the largest of our cities, in the small cities and in the towns, was no easy matter. I believe we have a good tariff now, with possibly only one mistake, and that was the result of too great a care for our clients' interests. Allow me to beg any member who may feel dissatisfied with this tariff or any part of it to remember that there is a great diversity of interests to be considered and the final outcome had to be one suitable to the largest possible number without regard to individual wishes in the matter.

It must be a source of considerable pride to us all that we have at last been able to meet in our own rooms, and the rooms committee and monthly meetings committee will report as to the furnishing of the apartments and as to the uses to which they have already been put.

It is to be hoped that our library now easily accessible will be freely used by the members and also such periodicals as we may from time to time supply ourselves with. There will be some exchanges which may prove exceedingly useful in the way of directing us where to find articles pertaining to special subjects on which information may be sought.

As to the ases of the rooms, there will, it is expected, be a great deal of social benefit resulting from the possession of a common meeting ground. Ihave not the slightest hesitation in saying that personally I expect in these rooms to make valued friendships and to enjoy meetings which if held elsewhere would lack much of the enthusiasm which will inevitably be aroused in such surroundings, but there will be, I trust, no dissenting voice when it is said that our professional home should, like the machinery of our whole organization, be used for the great end which should animate us all, viz., that of architectural education. This is an age of education and in many lines in which a few years ago it would have been con sidered quite unneccessary, facilities are now afforded and taken advantage of for a theoretical training where only "practical ex-perience" was considered necessary.

For general educational purposes in the wake of the kindergarten comes the manual training, and for the special benefit of the artizan there are the technical schools; other professions have long had systematic courses of study, and in our own profession there are abroad many inducements and opportunities for a higher and more thorough training than the generation preceding ours would scarcely have dreamed of.

There is a vitality in the architecture of the present, perhaps we might say the whole world over, and this is noticeable to no small degree in the great country beside us ; we should therefore not be lagging in the struggle to also emerge from the foggy atmosphere of past methods of study in our profession and to obtain a better basis to work on in the future, and as far as possible our rooms as well as our various efforts should be made to conserve to this end.

In President Emerson's address to the R.I.B.A., which possibly most of you have read, he recognizes certain necessities and problems with which we also are face to face. He admits the necessity for methodical training, though he believes it might be given with possibly less of what might be termed the weariness of the French training. He refers to the need for trained familiarity with work of the past so that an architect gifted with any power of freedom of thought and expression should, while avoiding weariness, be able to avoid faults of proportion and detail so common to the untrained and so exasperating to the trained.

The French themselves and those who can afford to become French temporarily have a great advantage in the well known school of architecture, though America is advancing with such strides in the study of this art that the incentive to go to France is becoming less each year, the influence of the former having permeated the latter to a great extent, and as Mr. Ernest Flagg says, that although "architects" are still striving for the extraordinarily original, and deprecate the Frenchifying of American architecture, students are working along the correct and same lines of study fully convinced that the logical reasoning taught by the great French masters is the proper preparation for their work.

In view of this widespread tendency to progress in the proper study of architecture and because there may be many of our own countrymen who cannot attend either the French or American schools, and because there may be others who could go but who are worth keeping in Canada for a large part of their time, we cannot turn our attention too quickly and too faithfully to any phases of the work which may be within our reach.

The report of the Educational Committee puts before you the scheme we have decided upon—a scheme formulated by a joint committee composed of some members of our Association and some from the Toronto Eighteen Club, and though the inauguration of the scheme has hung fire it is what we are looking forward to as one of the main works of our Association. In this connection I would like to mention our appreciation of the way in which the School of Practical Science has sought through our valued member, Mr. C. H. C. Wright, to adapt itself to our wants in spite of the fact that it like all such schools does neither advise nor like "special" courses, and the Council of our Association is heartily desirous of seeing that institution made use of in the near future by a large number of students.

To those who are neither my seniors in years nor in practice I would like to suggest that we practising architects do not leave progress for draughtsmen and students alone, but that we also keep abreast of the times and perhaps study sedateness and reasonableness to a greater extent than some of us have done, although it is apparent to everyone that this is more difficult in a country where there are few monumental buildings of any kind and particularly of the domestic type.

Buffalo's great Pan-American Exhibition will be a boon professionally, and I presume will be visited by every architect in these parts of Canada within reasonable distance of our, comparatively speaking, neighbor city. Although in no way an agent of the great Fair I would urge every one to take advantage of this latest opportunity to study architecture on a large scale and in the form of object lessons. From a preliminary canter around the grounds it would seem to me that America has after first whipping Spain turned around and stolen her clothes and is wearing them in a very attractive manner.

In Mr. Emerson's address, above referred to, he, recognizing the same difficulties with which we have to contend, admits the necessity for legislation, something I understand hitherto opposed by the R.I.R.A.

The old story of unsatisfactory competitions has once more, like the ditches and watercourses act in our legislature, to be resuscitated. In one instance an effort was made by a couple of members of the Association to have better conditions fixed, but the result was only a promise to have two experts from our Association retained to act with the Board in their decision and the emoluments offered, much too insignificant, were not enlarged.

In England competitions for public buildings have to some extent been abandoned, but not altogether, as the competition for the London council's great works has proved; the comparative similarity in style amongst the competitors was both noticeable and instructive.

It is a matter for regret that there seems to be a tendency for private individuals to seek to obtain competitive sketches for small work—something that I believe cannot be too emphatically discouraged by our members.

After much discussion a revised model contract was agreed on by a committee of the Association and a committee of the builders, approved of by our Council and then rejected by the Builders' Exchange.

In the matter of the consolidation of the city by-laws our registrar has been promised a copy of those parts relating to the building laws, which will be submitted to the committee when received.

In conclusion allow me to express the hope that this convention will be one pleasant and useful, and to the visiting members particularly we extend a hearty welcome. I believe there is possibly less need just now to urge unanimity than for a long time past as we are all looking forward in confidence to a splendid future for our Association.

Mr. Baker read the Treasurer's report, which on motion of Mr. Gray, seconded by Mr. Burke, was adopted :

TREASURER'S ANNUAL STATEMENT, JANUARY, 1901.

RECEIPTS.

4 Registration fees	$60.00	
Students' registration fees	6.00	
Students' examination fees	10.00	
Members' annual fees, class I.	195.00	
" " " " III.	21.00	
" " " " V.	16.00	
" " " " VI.	4.00	
" " " " VII.	20.00	
Engineers, for share of furniture	26.50	
Interest on bank balance, 1900	33.60	$392.10
Balance from 1899		995.25
		$1387.35

EXPENDITURE.

W. R. Gregg, Registrar	$100.00	
W. R. Gregg, disbursements	25.00	
Printing (including schedule of charges)	44.75	
R. M. Williams, engrossing	11.75	
Duffet Co., chairs for convention	3.00	
Nordheimer Co., piano Dec'r meeting	2.25	
F. Henry, expenses, Council meeting	7.00	
Cromhie, Worrell & Gwynne, account	4.00	
C. H. Mortimer, CANADIAN ARCHITECT AND BUILDER account	22.00	
Discount, Collingwood cheque	.15	
Furniture for rooms	131.89	
Kay & Banks, insurance premium	5.36	
Electric light account	1.09	$358.24
Balance on hand		1029.11
		$1387.35

We have examined the books, vouchers, etc., in the hands of the Treasurer, and certify that the above is a correct statement thereof.

JOHN GEMMELL }
C. H. BISHOP } Auditors.

All accounts which have been presented have been paid. The accompanying statement shows that the affairs of the Association are in a satisfactory condition, the ordinary expenditure for the year being nearly $100.00 less than last year, while the ordinary receipts are about $135.00 greater. After most of the furniture necessary for the rooms has been paid for the balance on hand is $1029.11 or $33.86 more than last year's balance, while the furniture remains an asset.

Respectfully submitted,
F. S. BAKER, Treasurer.

On motion of Mr. J. Wilson Gray, seconded by Mr. E. Burke, this report was received and adopted.

Mr. William R. Gregg then read the registrar's report as follows :—

REGISTRAR'S REPORT.

The Council has been in session fifteen times since last annual meeting. In the former part of the year the meetings took place in Mr. Langton's office, Mr. Wickson's office, the School of Practical Science, Mr. Townsend's office, and the Registrar's office, but since Nov. 13th in the Association Rooms.

After necessary notice of motion, a resolution was passed by the Council on 12th March that "Architects who have not registered or passed the examinations prescribed by the Association, but who otherwise satisfy the requirements of the Ontario Architects' Act and who apply before Dec. 31st, 1900, may be admitted without passing the examinations prescribed for students, if the Council after taking such steps as may be necessary to satisfy themselves of the qualifications of applicants, are agreed as to their fitness."

This motion was published twice in the CANADIAN ARCHITECT AND BUILDER and a number of applications were received before the end of the year, and as a result the Council has accepted 12 architects as qualified to be registered as members of the Association, each upon recommendation of the Board of Examiners.

In accordance with a motion passed in the convention of 1898 the names of members in arrears for a period further back than 1898 are omitted from the annual list of members which is now submitted. Each member whose name has been dropped in this way has been first notified by registered letter that his name would be omitted if arrears are not paid up to this point. The membership now is; 2 Honorary members, 33 Resident members, 27 Non-resident members, 5 Travelling members, Total 67 members.

A certificate of membership is now ready to be issued, intended for display in the offices of members, who are reminded that a motion was passed at last annual meeting requesting the adoption of the words "Member of the Ontario Association of Architects," as our distinguishing title.

One student registered in 1900. Examination was held in April. One student passed the second examination creditably.

The Council has jointly with the Engineers' Club of Toronto completed the arrangements in regard to the lease of these rooms, for a period of three years from 15th Nov., 1900, at a rental of $300 per annum, heating and caretaking included, of which this Association pays $150.

Messrs. Gemmell, Pearson and Townsend are the Committee in charge of their furnishing and management.

The furniture and other property of the Association has been insured for $500.

A committee, consisting of Messrs. Dick, Darling, Townsend, Denison, and Curry was appointed by the Council to draw up a tariff of fees as a guide to members in making charges for professional services, and this committee reported, recommending that the present tariff of the American Institute of Architects should be adopted. Copies of this tariff were procured from the secretary and carefully considered by the Council and certain minor changes were made, after which it was adopted. Five thousand copies have been printed; of which twenty-five have been sent to each member of the Association and the remainder kept for future distribution.

The Council, by request, appointed a committee to meet with the Builders' Exchange of Toronto and consider the question of improvement of the form of contract now in use, which is called the "Model Contract." After a number of meetings a report of changes recommended by our committee was submitted to the Council and adopted. No form of contract for general use has yet been printed embodying these improvements.

The library has been in the hands of a committee, Mr. A. H. Gregg, chairman.

It was found impossible to issue a Report of the proceedings in separate form in 1900 but it has been resolved that it shall be done this year at the close of the present Convention, and an Editing Committee has the matter in hand, Mr. M.B. Aylesworth, chairman.

It was resolved by the Council, as was proposed at the last annual meeting, that a regular monthly meeting should be held in the rooms upon the first Tuesday after the tenth of each month excepting May, June, July, and August, and a standing committee was appointed to arrange the programme of each meeting. Mr. F. S. Baker is chairman.

The question of Education of Students was given a great deal of consideration by the joint committee with members of the Toronto Architectural Eighteen Club, and a report presented to the Council which was further considered by the Council's Committee on Education, and a new curriculum was prepared and received by the Council, and after having been published in the CANADIAN ARCHITECT AND BUILDER in August was finally adopted on 15th January 1901, with the condition that the clause requiring matriculation of students before entering should be allowed to stand in abeyance until such time as it shall be found practicable to enforce it. The former curriculum has been kept in force until the present time, and it remains for the Council of 1901 to work out the details of the new scheme.

The R. I. B. A. has arranged to hold annual examinations in Canada, and our Council has appointed Messrs. Townsend and Langton as examiners to act with others appointed by the Quebec Association of Architects.

An advertisement in the CANADIAN ARCHITECT AND BUILDER gives further particulars of these Examinations.

Mr. S. G. Curry has written the registrar stating that he holds a sum of about $250, funds which the Toronto Architectural Guild before it disbanded decided to hand over to the Ontario Association of Architects under certain conditions : to be invested and held in trust for purposes stated in the conditions of the gift. The Council has not yet received fuller information on the matter ; but will be pleased to carry out the conditions of the bequest.

After notice of motion a new by-law has been passed to-day by Council, as follows :—Members who have resigned or failed to renew their membership shall if they resume membership pay a fee of $15 dollars which shall include the annual fee for the year current at the time of resumption of membership.

Mr. Burke : With reference to insurance, is there any provision made for protecting our documents, minutes

&c. ? No insurance could replace the loss if a fire should destroy our documents.

Mr. Gregg : The insurance policy reads "books, documents, &c." I do not remember the exact words, but it mentions the documents.

Mr. Burke : What I mean is, is there any provision for preserving these from fire ?

The President : There is nothing at the present time.

Mr. Baker : Perhaps Mr. Chairman the Rooms Committee will tell us. The original plan shows a fire-proof vault, or two of them, in fact, one for the engineers and one for the architects. Of course the arrangement is very different from that, but there may be some explanation of it.

The President : Perhaps in the report from the Rooms Committee that will be mentioned.

The Registrar's report was adopted on motion of Mr. Baker, seconded by Mr. Townsend.

Mr. Langton : I would like to know Mr. President why there is this vagueness about the bequest from the Guild. No one seems to know what the conditions are.

Mr. W. R. Gregg : I will read the letter.

WM. R. GREGG, Esq., 61 Victoria St., City,

Dear Sir,—I hold about $250.00 of funds which the Toronto Architectural Guild before it disbanded decided to hand over to the Ontario Architectural Association under certain conditions.

These funds can be handed over as soon as the necessary arrangements are made to carry out the conditions of the bequest.

It will be necessary for the Council of the Association to accept the bequest under the conditions named and to make arrangements to invest same in a separate and distinct fund to be held in trust for the purposes stated in the conditions of gift.

The above amount is not all that should be received, as there should be a further payment on account of the Farmers' Loan Company's assets.

Yours truly,
S. G. CURRY.

Mr. Langton : Yes, but what are the conditions? When was that letter received ?

Mr. W. R. Gregg : That letter was received on the 19th of October. I answered that the Council would be pleased to carry out the conditions if they would let them know them, but I received no reply.

Mr. Langton : I think Mr. Curry ought to let us know what the conditions are. I move that Mr. Curry be written to at once and asked to hand over the money. As we appear to have accepted the conditions without question he ought to give up the fund.

Mr. Burke : Are these conditions not in the Association minute book ?

Mr. Baker : I would like to ask that the minutes of the Council on that matter be read.

Mr. W. R. Gregg read : "Resolved that the Council of the Association gratefully accepts the bequest of the Toronto Architectural Guild and would be glad to have the conditions submitted to it."

The President : Mr. Langton has moved that Mr. Curry be asked to state the conditions and send us the money.

Mr. W. R. Gregg stated this had already been done.

Mr. Baker : Could not Mr. Curry be again asked to send the conditions ?

Mr. Helliwell seconded Mr. Langton's motion.

The President : It has been moved by Mr. Langton, seconded by Mr. Helliwell that Mr. Curry be formally asked to send us the conditions, so that we may know what we are to do.

The motion was carried.

Mr. Baker, convener of the Monthly Meeting Committee then reported : I think the Agenda shows pretty well what the Monthly Meeting Committee has been doing. The Committee will immediately prepare the programme for the next monthly meeting. The meeting which is set forth on this Agenda paper, I think looks rather hopeful, as good as any we have ever had, and I think we will look forward to the monthly meetings as they follow one after another. It was thought well at one time to have the programme announced at the previous meeting. But it was stated that if we gave the programme out a long time ahead, the men who were to read papers would forget about it, and not appreciate the long time given them for preparation. There is one thing I think should be established—a night when the members could come to the rooms and meet each other—something in the nature of a club. We have had some very nice social gatherings. We cannot expect to get all the city members out at once, but we could have several pleasant evenings. I think a motion might be made here if you think well of this idea.

The President : I think this is a matter for the Meeting Committee to take up.

Mr. Baker : I think it should be discussed by the Convention. I move that Saturday night be decided upon as a night upon which members would resort to the Rooms, especially with a view to meeting other members.

Mr. W. R. Gregg : I think it is rather a pity to decide suddenly without the Committee's consideration. It occurs to me that it should be on a night not a Monday or Saturday, so that outside members could drop in and meet Toronto members.

The President : I suggest that the matter be allowed to stand awhile and be brought up later. I think Mr. Baker omitted in his report the pleasure which we had of listening to an address by Rev. Dr. Clarke, of Trinity University, an address which I think everybody enjoyed.

Mr. Gemmell was then asked to read the report of the Rooms Committee, but said that the report would necessarily be largely financial, and the accounts were not yet all received.

Mr. Langton in Mr. Pearson's absence read the report of the Library Committee :

The library was kept for the early part of the year in Mr. W. A. Langton's office, later in the office of Messrs. Langley & Langley, and in November it was moved to the Association Rooms.

The Association is indebted to Mr. Henry Langley for his generous donation of 61 bound volumes of the "Building News" and other magazines, besides a large number of unbound copies of the same, and also to Mr. Mark Hall for seven years of the "Canadian Architect and Builder."

In addition to the above, the library contains 77 volumes of architectural works, which are available at any time by members of the Association and registered students.

The duties of the librarian have been performed in an informal manner by the Library Committee during the year, and it seems now desirable that a regular librarian be appointed.

Two books, Baldwin's Steam Heating, and Viollet-le-Duc's Habitations of Man, are missing.

Offers of further donations of books have been made to the Association, and the Committee recommends that new books be purchased from time to time, especially text books which would be of use to the student, and such recent publications on heating, ventilation, etc., as would be of service to the busy architect.

The Committee also recommend that the file of the "Canadian Architect and Builder" be completed and bound in yearly volumes."

This report was received and adopted on motion of Mr. Gouinlock, seconded by Mr. Langton.

Mr. Burke was asked to make a report with reference to the Chapter.

Mr. Burke : The Chapter is dead ; that is all I know about it.

The President : It is scarcely so dead as all that. I thought that they met and appointed representatives to the Technical School Board, which is practically all there is left for it to do since the Association has established monthly meetings.

Mr. Burke : I forgot to mention that we met and appointed members to the Technical School Board. We have also been keeping it alive by holding lunches here, and it is a question perhaps, if we could not keep up these lunches and have all the members attend.

Mr. A. H. Gregg read the report of the Educational Committee :

REPORT OF EDUCATIONAL COMMITTEE.

A summary of the work of the Educational Committee was published in the August number of the CANADIAN ARCHITECT AND BUILDER.

The Committees' report has been adopted by the Council, with the condition that the requirement that students must be matriculants be not enforced for the present, although this was deemed a desirable feature, which should be introduced as soon as possible.

Following is the curriculum as arranged by the Committee:

GENERAL REQUIREMENTS FOR ADMISSION.

Students to have passed Matriculation and to be articled for five years with architect.

(or) Students who have graduated from School of Practical Science shall be required to serve only three years with architect

one of which three years may be served during vacations of said school.

Course of study to include three branches.

"A" Scientific. Subjects in this branch are taught at the School of Practical Science.

"B" Business or Craft Training. Including subjects in which student should become proficient in his regular office work, supplemented by study of technical books as recommended.

"C" Design. A three years "Studio" course occupying three months (November, December, January) in each year.

Studio work to be taken in Association Rooms, during afternoon or evening, as convenient, under patronage of practising architects.

Examinations to be held each year in Courses A. and B.

In the studio work a progression by mentions will be required.

1 Year "A" Analytical geometry, euclid, trigonometry, algebra, history of architecture, chemistry.

2 Year "A" Calcus, history of architecture, dynamics, statics, descriptive geometry.

"B" Elements of construction, technical terms (as applied to practical architecture), practical knowledge of building trades.

3 Year "A" Descriptive geometry, heat and optics, strength of materials, applied chemistry.

"B" Practical knowledge of building trades, foundations, structural iron work.

"C" Preliminary studio work (drawing of classic detail and shadows).

4 Year "A" Hydrostatics, mineralogy and geology, constructive design.

"B" Steel and iron construction, nature and properties of materials.

"C" Studio work.

5 Year "A" Hydraulics, compound stress, mineralogy and geology, applied chemistry, sanitary science.

"B" Architectural jurisprudence, (practical) heat and ventilation, (practical) sanitary science.

"C" Studio work.

Probably the most successful school for architectural design, that the world has ever known is the Ecole des Beaux Arts at Paris, and the following notes taken from a series of papers by Ernest Flagg, may be of interest :

This school is supported by the government, and to obtain the privileges of the architectural course the following "admissables" must first be passed.

(1) Architectural Composition. In this examination 12 hours allotted to the study of given problems in design, plan, section and elevation to be drawn.

(2) Modelling in clay, for which 8 hours are allowed to reproduce in clay, a plaster cast of a piece of ornament.

(3) Drawing from the Antique.

Should the prospective pupil prove himselt proficient in these subjects, he may then try the examinations in descriptive Geometry, Algebra, Arithmetic and History, (general) and if successful in passing these, he may then be enrolled as a pupil, and enter the atelier of his choice.

The school is divided into 1st and 2nd classes. Entrance to the 1st class is obtained by gaining a required number of honorable mentions in the following subjects: Theory of architecture, history of architecture, descriptive geometry, steretomy, perspective archaeology, drawing of ornament, drawing of the human figure and modelling in clay.

Upon attaining to the 1st class and obtaining a certain number of honorable mentions therein, he is allowed to choose a trial programme for the design of some monumental building, and should he be successful in this he receives his diploma from the government and becomes a full fledged architect.

During the course great stress is laid on theory of architecture, which occupies the greater part of the student's time. Construction takes the best part of a year.

In the theory of architecture, six projects are given each year, For these, a preliminary sketch is made at the school and 12 hours allowed to show plan, section and elevation, which may be very vague and drawn to a small scale.

This sketch must then be approved by the student's patron, then rendered, i. e. studied, and full drawings made.

The eteliers are the most noteworthy features of the Ecole. These are under the supervision of practicising architects who have won distinction in the profession and who visit the studios two afternoons a week to give criticisms and advice.

Mr. Baker : Has anything definite been done abont arranging classes to be held in these rooms?

The President : There is a Committee on studio work (that is the work to be done in these rooms). This Committee has not at present time prepared a report. They have not actually started the classes. I wrote to the Convener the other day and told him I thought it would be well to start now and not let this winter go by with nothing done.

Mr. Helliwell : A report like that is very comprehensive, and is rather a big thing for a Convention like this to attack. Has the Committee in charge any recommendations in regard to the report?

Mr. A. H. Gregg : I may say that the committee that prepared this report is really defunct. I simply read it now that it might be laid before the convention but it is expected that the convention will form other committees to carry out the work this committee started. The committee appointed was Mr. Edmund Burke, Mr. C. H. C. Wright, Mr. Eden Smith and myself. A great deal of time was spent in comparing the past curriculum of the Association and the School of Practical Science curriculum, and in trying to improve ours so as to get a more complete course of study. In the first place the scientific course that all architects ought to go through was considered by the committee as best taken at a school under professors that make such work their business, and the School of Practical Science was that school for Ontario. The regular course there is three years. As a majority of students intending to become architects start their career in an architect's office, provision has been made that such students can take a course at the School of Science by spreading their studies over five years. In this way a student in an architect's office by obtaining leave of absence for an hour or so a day can attend the classes at the school. It is already established by our Act that a graduate of the School of Practical Science need only serve three years in an architect's office and if we press the educational requirements upon our students no doubt many will see the advantage of disposing of the question by taking a full course at the school. But I am speaking chiefly of the way in which the ordinary student will be affected. Of course such a departure as the proposed curriculum, is a very important one. Probably there will be changes made, and I think that the Council considers that the educational work of the Association is probably the most important work of next year, and it is certainly most important that a strong Educational Committee be formed.

Mr. A. H. Gregg then read a brief account of the manner in which the architectural course at the Ecole des Beaux Art, at Paris, is carried on.

Mr. Burke : Mr. Gregg, I think has forgotten to mention that there was an alternative proposition, that is, that if it should prove impossible to carry out such a scheme of having our pupils spend one or two hours a day at the School of Science, that the next best method would be to have our students attend the mathematical classes at the Technical School. That seems to be the only other feasible method that could be adopted, for ordinary students.

A Member : Have we any recommendations from the council with reference to this report?

The President : The Council has adopted that report.

A Member : It is then for us to accept that report and to appoint a committee.

Mr. Paull : What is this committee to be appointed to do?

The President : This committee is to take up the work of this scheme of education.

Mr. Burke : I think this is a matter which concerns the whole Association, for if we are not prepared to have our students go up to the School of Science for lectures, it is really no use to have the committee appointed to forward the scheme.

The President : I would like to hear from members of the Association, particularly those who happen to have students now. With reference to this scheme of education, thereis one thing which the committee was confrontedwith. That is, the students who are in cities and towns outside of Toronto. But as it was impossible to get a system of education which could be locally applied it was thought that there was no alternative but to get one which they would have to come to Toronto to take. Students in other professions have to come to Toronto for their education, and architectural students would soon get accustomed to having to come also. The only way is to establish the means of education, and that would bring them to it. I think this Convention ought to express it's approval or disapproval of this scheme, if the members have been able to digest this suggestion.

Mr. Langton : I suggest that Mr. Wright be asked to explain the school work.

Mr. Wright : The educational scheme which is proposed, classifies the training of an architect under the three heads, Scientific, Practical, and Design, and it is the intention inthis report to allow any candidate to elect tot ake them up in the order named or simultaneously. If he elects the former he attends a school of Applied Science for three years, following which he spends two years in an office where he obtains the practical training, while in the evenings he attends the classes in studio work which gives him his training in design. In case the student selects the second method he is required to spend five years in an office and on an average about two hours a day in the scientific subjects taught at the School of Practical Science. These subjects I may say include those necessary for scientific and safe building and have been arranged systematically, (the simple laeding to the more complex) to cover the entire course of five years. As before he spends his evenings under the care of patrons of this Association studying design. It would seem to me that the two main difficulties from the point of view of the practising architect are, 1st to obtain pupils of a standing equivalent to university matriculation, and 2nd, to provide the time during office hours necessary for the scientific subjects when the work is taken simultaneously. I believe however that these and other difficulties will adjust themselves in time and both pupils and principals will be benefited.

Mr. Helliwell : Mr. Chairman there is one thing possible that might be done. A thorough canvass of the offices might be made to see if students would accept the motion as a whole or adopt this course, then a committee might be formed to arrange classes and appoint teachers.

Mr. Gemmell : I think the convention ought to pass upon the scheme, and the details of the scheme be arranged by the committee or by the Council. I think it is the duty of the convention to appoint patrons to lecture on the theory of architecture and practice, and on design, &c. I think they ought to adopt that. They may not be able to live up to it altogether, but I think they ought to adopt it, or else go backward.

Mr. Langton : I think that another course might be taken than that suggested by Mr. Helliwell. It might be possible also to approach the question also from another way. Members of the Association who have students in their offices might make something more than an enquiry of them. Their relation to their students is parental and if they are in sympathy with the aims and methods of the Association they should prescribe its educational course as part of the work of studentship.

The President : As to the architects' willingness to lose the time of their students, I think the architects would be repaid for it in the extra value of the pupils. I know that the only experience which I have had with the School of Science pupils was a very satisfactory one. The gentleman whom I had in my office came from the school and it was only a very few days before it was evident that he was worth more than another man, and I think it would repay the architects to take this course. It might inconvenience them at first, but it would repay them in the end. I think we ought to keep in line with other professions, and we can only do it by a little sacrifice on our part.

Mr. Burke : I want to say in connection with what Mr. Wickson and Mr. Wright have said, I know a man who had been in the school and came into an office ; he was away behind another student who was in the office, but after being a year in the office the School of Science man forged away ahead of the man who was educated in the office.

Mr. Gemmell : I move that this Convention approve of the scheme to produce better education of students in connection with the School of Practical Science, and of the endeavor to establish departments of studio work and branches which are to be taught in the school.

Mr. Gray : That is exactly an adoption of this report.

Mr. Gouinlock : Mr. Chairman, I would like to know whether it is proposed that it should be compulsory for the members to allow their students to attend the school.

The President : If a member agreed to allow the student to take the course he would naturally have to give him the time to do it. I presume you mean though that as members of the Association, are we bound to? I do not think we could compel a man to take this course. I don't think the powers of the Association would enable us to write a member off the list because he refused to let the student take the course which we considered the proper one.

Mr. Baker : Before we put that motion I think I will suggest, just to test the feelings of the meeting, that this Convention advertise this scheme by fully reporting it in the CANADIAN ARCHITECT AND BUILDER, and that a request be made that all students who wish to take the course should send in their names to the Registrar before a certain date.

Mr. A. H. Gregg : The Committee's report has already been published in the CANADIAN ARCHITECT AND BUILDER, and a number of students have asked that something of that kind might be started. If he considers that too much to force on the members of the Association, that by-law can be changed ; that is all there is about that. And the studio work means classes in which local practising architects who are willing give their time to criticise and advise the students in their work and design as carried out in studios in New York and other cities. It is voluntary and we will have to find architects that are willing to do so.

Mr. Baker : I am very glad to hear that the students are ready to take up the work, and I think it only remains now for us to decide upon this scheme and to arrange classes and appoint teachers. I think it had better be put right on the shoulders of the Convention.

Mr. Wright : I think, Mr. Chairman, for the purposes of this discussion we might divide the students into two classes—1st, those who are registered and at work, and 2nd, those who may registrar during the coming years. If we are providing for this latter class I think the proper one to canvass is the architect and not the student. If you ask the student he will have the examinations made easy, while after he is through and becomes the architect he would make them hard. (Laughter.) There are a few advanced students in offices who will require special consideration if a scheme like this is carried out, and I am sure a number of the members of the Association are willing to grant the time to these men to help them in their difficulty. I am quite willing as far as I am concerned to help them with their advanced mathematics, and as far as their other work is concerned I am sure that they will get the necessary help. I think we should consider more especially those who are proposing to enter the profession and not those who are at work.

Mr. Burke : I agree with Mr. Wright and think the students should be recommended to brush up their studio work and endeavor to take up the School of Science work. Our plans for the future should be for future students. I have had several applications from students, and have recommended that course, but the guardians have not seen their way clear to go to the expense involved. I think we should make the matter of higher education a strong point with regard to students.

The President : I think the architects should look at it in that way. To a young man who applied to get into my office I pointed out both to him and his father that the only right way if they wanted him to become an architect was to follow our course of education.

Mr. Burke : I am glad to announce that there are fifteen or sixteen young men to meet to-night in my office for studio work, and all we have to do is to ask them and they will come right into a class for study.

Mr. W. R. Gregg : This system of studio work is one of the most important developments of architectural education. In the present time it is recognized that design is not learned by sitting down with a blank paper before you, and a blank brain, and trying to put a building on the paper. It is a matter of teaching the student to think and to do a thing in the proper way, and this studio work is as great a boon to architectural education as the kindergarten is to primary education.

Mr. Baker : Mr. Chairman, we are all perfectly agreed on these beautiful theories. Now what I would like to get at as usual is something practical. Could you not appoint a committee to report to-morrow to immediately arrange for getting to work in these rooms.

The President : There is one thing : first to get

the members to adopt this motion approving of this course.

The motion made by Mr. Gemmell was then seconded by Mr. Langton and carried by the meeting.

Mr. Langton : Mr. Chairman, the question is how to get the students. I would suggest that Mr. Baker's proposal of a committee to suggest the names of patrons before to-morrow morning, and consult them if possible, be carried out.

The President : In reference to this motion that we appoint a committee to see patrons, would it not clash with the committee which is appointed to carry this on ? think there will likely be a committee appointed to carry this on. Possibly their duties may dwindle down to seeing the patrons and arranging about the way these classes are to be held and that sort of thing. There is a Studio Committee existing at the present time consisting of Mr. Eden Smith, Mr. A. H. Gregg and Mr. Darling.

Mr. Gemmell : Are we not to understand Mr. A. H. Gregg to say that they have done their full duty and ask to be disbanded ?

Mr. A. H. Gregg : The principal thing is to settle whether we want as an Association to adopt such entrance examinations, and whether it is to be compulsory for all architects to require their students to go through the course. In my mind it is a great mistake to have any rules and by-laws that are not enforced. There is no use putting a by-law in the books saying that members of the Association are not to have unregistered students in their offices, unless they are prepared to enforce such a by-law.

Mr. Langton : We cannot force architects to do anything, but we can make a very good course of examinations, and it is to the advantage of the architect to make his students take it, and if he cannot make them take it it is to his advantage to get students who are willing to take it. The great thing is to make this curriculum so that students and architects will desire to support it. It strikes me that it will in time become necessary for students to take it, just as it is in Boston for students to take a course in the Massachusetts Institute of Technology. Were we to refer this back to a committee, Mr. Eden Smith, Mr. Gregg and Mr. Darling, there is only one thing for them to do ; the rest is done. We have the curriculum ; we have, as Mr. Gregg and Mr. Burke have said, students waiting to take it up. The only thing that remains is to select the patrons for the studio. This is all any committee can do if we refer it to them, and as Mr. Darling and Mr. Eden Smith are not here, to refer back to a committee of which they are members means a delay and a delay which is unnecessary, for we can appoint a committee of this convention which can make a selection of patrons and communicate with them to obtain their consent, so that before this convention breaks up we shall have the whole educational system settled. I therefore move that the President name a committee of the convention to appoint patrons, if possible to communicate with them to obtain their consent, and report to the meeting to-morrow.

Mr. Baker : I have much pleasure Mr. President in seconding Mr. Langton's motion that we do this thing right now. If to-morrow these names are brought before us and approved, why we can act. Let us do something, let us get ahead, we have got together now at this convention, and we have only to decide. Of course I know why the thing has been let slide for the past year, but courtesy does not demand anything further from us in that direction.

The motion was carried, and the President named as the Committee Messrs. A. H. Gregg, C.H.C. Wright, Eden Smith, E. Burke, S. H. Townsend and A. F. Wickson.

REPORT OF COMMITTEE IN CONNECTION WITH CERTIFICATE.

Mr. Baker : Mr. A. H. Gregg and myself were made a Committee to procure designs for a certificate of membership to be put in the possession of each of the members of the Association, to be retained by them as long as they remained members of the Association, and to be returned by them when they ceased to be members. The matter proved a very difficult one indeed. One or two designs were submitted by the architects, but none of them seemed to be desirable ; at the last moment when it seemed necessary to act, it was decided to ask Mr. A. H. Howard, who is a professional designer, to prepare a design, which was done. The certificate which you see on the wall here is the one. This design was not thought altogether satisfactory, but still it was accepted as the best we could get, and we ask the Convention to bear with it, and try and realize what a difficult subject it was to treat. I think it will be a certificate that every member will be glad to have. It certainly is a distinction to be a member of this Association, and none of us should hesitate to have this certificate hung in our offices.

The President read a letter from Mr. Taylor, Secretary R. I. B. A. examinations in Canada, and it was moved by Mr. Baker, seconded by Mr. A. H. Gregg and carried, that a circular be sent out to members calling attention to these examinations with a view to securing candidates.

Mr. Burke : Anybody who reads the by-laws of the Association will observe that a number of the by-laws have become practically obsolete. Would it not be well to remodel these by-laws and bring them up-to-date. We cannot hand the by-laws of the Association to any new member without misleading him ; I therefore move, seconded by Mr. Helliwell, that the Council revise the by-laws and have them printed before the next annual meeting.

Discussion ensured as to the need of revision in portions of the Act of Incorporation and the possibility of procuring such revision.

Mr. Burke moved that action in regard to the amendment of the Act be left to the discretion of the Council. Seconded by Mr. Baker, and carried by the meeting.

Mr. Baker moved that a circular be sent out in reference to the R. I. B. A. examinations, to the architects and members of the Association.

The President : I think some architects who might not read the notice in the CANADIAN ARCHITECT AND BUILDER might read the circular.

The motion was seconded by Mr. A. H. Gregg and carried.

WEDNESDAY'S PROCEEDINGS.

The President took the chair at 10:30.

The Committee appointed on the previous day to suggest the names of patrons for the studio work reported. After some discussion the report was adopted, with the following gentlemen appointed as patrons :—Messrs. Darling, Gemmell, Langton, Symons, Horwood and Eden Smith.

Mr. Burke : Are we to understand, Mr. Chairman, that absolutely no students except those in offices of members of the Association, will be eligible for studio work ?

Mr. Baker : Not unless they are registered students, of course.

Mr. A. H. Gregg : I think that is a question that should be left open for the present.

Mr. Baker : Before a student joins this class he should become a member of the Association. It is one of the ways we have of strengthening the Association.

The President : I think your idea is that a student outside the Association altogether should not be allowed to come in here and take the studio work without having become a member of the Association. I think that is an understood thing.

Mr. Burke : There is a case in my office. A School of Practical Science man, unable at present to take his course, is spending a few months in my office. He does not know what he is going to do yet. Will he be debarred ?

Mr. Baker : I think there should be the greatest freedom possible in this matter in its early stages. A trial should be given, but it should be understood that students should be registered.

Mr. Wickson : According to our by-laws can we register a student who does not take the examinations ? Mr. Baker's idea seems to be that, suppose there is a draughtsmen's club or something of this kind formed, it is not permissible for a student to come and take advantage of the studio work because he is a member of that club without joining the Association.

Mr. Langton : Remember, these classes are free. To register costs six dollars. Any student might well pay the six dollars merely to get the advantage of these classes.

Mr. Burke : I think that would be satisfactory.

Mr. Baker : That would also apply to students in the offices of men who are not members of the Association.

Mr. Wickson : Mr. Langton, is it the case that no student can register unless he is articled to a member of the Association ?

Mr. Langton : It is put in another way that students of the Association must be articled for so many years to a member of the Association.

The President : It comes to the same thing.

Mr. Wickson had here to leave the convention, and Mr. Burke took the chair.

Mr. Langton : Mr. Chairman, it has just been pointed out to me by Mr. Munro, that students cannot get into the Association, although there is a by-law that students must be registered. It is just as well that students should have to pay an examination fee to join these classes.

Mr. Burke : I think it is a good idea. Mr. Baker asked if the Committee had made any plans regarding the starting of the studio work. We have not made any plans at all. We simply discussed the men for patrons. I do not know what we can say about the commencement. I daresay the proper thing would be to get the patrons together and see what they will do about starting their work.

Mr. Langton : I should like to bring forward some other business. The proposal that I wish to make is that the Council be instructed to take some step to memorialise the Government to have some Dominion buildings designed by architects in private practice, instead of all by government architects. Mr. Fuller the government architect died some time ago and since his death no chief architect has been appointed. Mr. Fuller was singularly fitted for the position, and it will be very difficult to find a man who will fill his place. It is a question whether in any case public buildings would not be better designed by private architects. The difficulties in the way of a chief architect as a designer appear to be greater than those in private practice. In the United States the plan I am proposing has been, after long advocacy by the profession, adopted, and the general opinion of its success as a method is the principal ground of confidence I have in bringing forward this proposed. It seems to be agreed that when the general architectural practice has reached a certain pitch of excellence there is no longer need for a government architect and indeed the advantage in favour of design is with the private practitioner. I think practice in Canada has reached the point when the transference of public designing from official to private hands should be considered. There is another reason why public buildings should come into the field of private practice, speaking of course from the point of view of the public good, and that is that there are always a certain number of monumental buildings being distributed to the profession which may be regarded as prizes to be aimed at and will have a material effect in elevating the aim of the profession and raising the standard of architecture. I move that the Council be instructed to memorialize the government on this question. A Chief Architect is just as likely to be appointed for political reasons ; while when he is appointed he is appointed for life ; there is not the same opportunity for repentance that there is in the case of the appointment of a private firm for one building at a time.

Mr. Burke : Do you consent to have the motion refer to the Ontario Government as well ?

Mr. Langton : Certainly ; and Canadian architects specified as well.

Mr. Gordon : While you are at that line, I think you should refer to Government employees engaging in private practice. I would move that the Council memorialize the Ontario Government in regard to this practice.

Mr. W. R. Gregg : I think that has already been passed upon by the Government. A Government employee is not allowed to use the public office or telephone for his own work. We have got all we could get from the Government. Why should we try them again ?

Mr. Gordon : Because there is a great deal to be gotten yet, and why should we not persist ? It is only by emphasizing the thing over and over again that it can be obtained. The Government can only be educated through the influence of the public. It is a thing that is comparatively small, but it will grow. It grew very rapidly in Ottawa, and it was only stopped in Ottawa by bringing pressure to bear upon the members in the Ottawa Government. And we have to take some steps.

Mr. W. R. Gregg : I think we should find out what the Council has done in the past, and if the Council has conferred with the Government in the past and got its answer, and still there is trouble, we should deal with individual cases.

Mr. A. H. Gregg : It seems to me that this is a kind of small, trades union sort of business. I don't see what we have to do with what men do outside of their office hours.

Mr. Symons : We might bring that to ourselves, Mr. President. The question of allowing a draughtsman to carry on work of his own is similar.

Mr. Gray : I second the motion. I think that Mr. Gordon's motion is along right lines. I also agree with Mr. Symons as to bringing this matter down to our own employees.

Mr. Langton : It is, I suppose, not our place as architects to interfere in this matter more than any others of the public, except in so far as it affects our practice. I should personally feel very slow about doing anything that was aimed particularly at improving our own practice, and I think that if it went in with the other memorial which it has been proposed to send in to the Ontario Government as well as to the Dominion Government, it might give the latter the appearance of having a motive that we do not intend. We ought to let this stand as it is, as a public spirited effort.

Mr. Baker : I would move, sir, an amendment, that while the convention approves of the principle of Mr. Gordon's motion, it take no action on it.

Mr. Gordon : I think it should be decided whether the motion is wise. If that is the case I am quite ready to amend my motion, that we approve of the principle that it is wrong for the government employees to engage in improper practice, and that at the proper time it be placed before the government. The case I have in view now is one of a building costing over a quarter of a million dollars, which has been put up by one government employee—which I think is not a very small amount, it is a very large thing. If the regular commission were charged there would not be any objection, but in cases of this kind these men, because they have no expenses, do the thing for a very meagre amount, and it has a bad influence on the whole profession, and that is what I am aiming at rather than preventing a civil servant getting a little business which might come to some of our offices. It is that aspect which appeals more strongly to me. I would amend my motion that we approve the principle that it is wrong for a government employee to engage in private practice.

Mr. Baker : I beg to withdraw my amendment in that case.

Mr. Burke : With the consent of the seconder we will amend Mr. Gordon's motion. (Carried). Is there any other business ?

Mr. Baker : Mr. Chairman, we should have a report from the Rooms Committee, and also from the Proceedings Committee.

Mr. Aylsworth : As Chairman of the Proceedings Committee I might say that the committee had one meeting since our last report, the only business being some preparation for printing the annual proceedings of the Association, another being called for next Friday evening.

Mr. W. R. Gregg: Before Mr. Wright reads his paper let me make one or two announcements. I don't think it is known to all the members in the city and those outside that the library books are sent to outside members. Any library book will be sent post paid to any outside member, if he sends a post-card for it, if he keeps it the specified time and sends it back at his own expense. The hardware merchant supplied fifty keys for the rooms, and any member desiring to buya key for 25 cents will have access to the rooms day or evening. I want to make an apology in connection with our agenda. I omitted Mr. Baker's title, A.R.I.B.A. I find that I may have had some excuse for this, as according to the last report of the proceedings of the Royal Institute, he has been received as a Fellow of the Institute, and the title Associate would not have been correct.

Mr. Wright then read a paper on "Design in Modern Architecture," which was received with hearty applause.

DESIGN IN MODERN ARCHITECTURE.

My excuse for taking up this subject at the present time, if any excuse is necessary, is the remark made frequently from the platform and through the press, that we are without any architecture, and that everything of to-day is copied. It is also a subject which I believe will provoke discussion and prove useful on that account.

In part then the object of this paper is to bring forth of itself and by discussion ideas which shall not only be profitable to us as members of this Association, but may also cause the general public to think somewhat differently of our work.

First, then, let me state a number of points, which you are all familiar with, but which under the circumstances will bear repetition.

All building is not architecthre, any more than all writing or language is literature, and it is quite as logical to condemn this latter art because there is so much trash printed, as to condemn architecture because the greater majority of the buildings on King street do not display any art. The same may be said of any of the arts, and yet these carping critics will in the face of all that is bad admit that we have modern gems of music, of painting, of sculpture, and of literature, and admit further that they may have to travel to hear and see them. But because they cannot from their own windows view the beauties of architecture everywhere, they raise the cry that all types of buildings of to-day are copies and that the two characteristics of modern architecture are. 1st, variety of style, and 2nd, lack of originality. Many aspiring architects have evidently this same deplorable view, for I have been requested on many an occasion to name a good book of architectural recipes. The demand is for something new, some new architectural invention. They say when looking at buildings where the openings are spanned by beams, i.e. are rectangular, why that is Classic, if round, that is Romanesque; if pointed that is Gothic, etc.

If then the openings in our modern work, in order to satisfy their desire for inventions, cannot assume any of these shapes we are limited to no openings, no entrance, no exit, no admission of light, etc. What do these people expect? Is is not safe to say that this is but an illustration of the old proverb, "a little knowledge, etc.," or rather, perhaps, a want of consideration on their part. Would not many of these same people give favorable descriptions of many of our modern buildings? Would not most of them find fault with many features of much if not all of the early work? I certainly think that we would get from them as favorable a criticism of a modern building that we might name as of any one building of the early periods chosen by themselves, and for that matter of any dozen or hundred buildings. Again it might be pointed out that we have records of but very few of the buildings of these early periods.

Let us stop this form of discussion and ask ourselves what are we doing and why are we not doing otherwise. We are not living in an age where the church, the state or the monarch (in any form) is all powerful, and can on that account divert unlimited wealth or resources in the line of architecture thus resulting in the erection of cathedrals, temples, palaces or castles. But on the contrary we are living in a commercial age—a period in which our art productions in architecture must be considered as investments and reduced to profit and loss in cold coinage.

Our admiration for a building to-day (and we have such admiration for many) depends upon the thought expressed in it, or, in other words, upon the thought expended in its design, and the greater the power of the mind of the architect who has created or developed the design, the deeper the thought expressed, and consequently the greater the lasting qualities in the beauty of the creation.

In the first place he must produce a plan that is perfectly suitable for the work intended. This may require a knowledge of the business and business methods of any of our commercial enterprises whose success in this economical age depends upon an almost innumerable number of small arrangements—or conveniences—or facilities for the transaction of such business, knowledge which the architect must obtain by experience not only of himself but from close and careful study, as well as from all the different clients for whom he has done or is doing work. Not only must he provide for this present service, but also for a growth of the enterprise, the rapidity of which is entirely problematical. Thus when an entrance is or may become necessary he provides for one—where light is necessary he admits it boldly, and where light is not wanted he leaves the wall surface whole. The result of this thought is an expression on the exterior, on the facades, of the interior requirements of the business, or of the purpose for which the building was erected. The building may from its exterior appearance alone declare it to be an armoury, a school, a court house, a church, etc. This classification is, however, very superficial, but the more masterly the subject has been treated the more minute does the classification become and the greater the range of thought expressed. But with this, as with any other art, the refinement in the production requires an equal refinement in the observer in order to be appreciated. In architecture we cannot hope to proceed much faster than we can educate the public to appreciate. It is therefore with feelings of regret that I read in the CANADIAN ARCHITECT AND BUILDER of December the following: "The Toronto Industrial Exhibition Association have sent out a circular inviting architects to submit competitive designs for a new main building and several subsidiary buildings. The cost of the main building is estimated at $106,000, and of the lesser buildings from $5,000 to $15,000 each. To the author of the accepted design for the main building a prize of $250 is offered, and to the author of the accepted designs for the smaller buildings prizes of $40 and $50. Architects are required to submit plans, elevations, perspective and brief specifications."

This sounds like throwing a morsel to a pack of hungry wolves.

Have the Industrial Association stopped to think over the above offer, or have they been led to believe in some manner that the above course was all that was necessary? Have these men, who are supposed to be shrewd business men, considered how long they might expect to employ the services of one respectable set of brains for the chances of the prize offered, viz., $250? Have they thought of the mere labor involved in the production of plans, elevations, perspective and brief specifications?

There is one ray of light however which should be encouraged, and that is their handing the appointment of judges over to the Ontario Association of Architects. For the sake of themselves, for the sake of the city, and for architecture generally it is a great pity that in making the provisions for the competition they did not also take the opinion of the O.A.A., which in matters of this kind is undoubtedly the best authority in Ontario.

Returning to our subject we find that another reason for the beauty in design lies in the careful study of the proportions of the various parts. These proportions cannot be set down in a column like the multiplication table; they are not mathematical but artistic, and are so interdependent that every problem must be studied by itself and the proportions adopted must be such as to give a proper scale and produce a harmony of the whole, a harmony which can only be made complete by a careful arrangement or grouping of these various parts.

In addition to all this, the material out of which the building is to be erected must receive careful consideration. We have on account of the long continued use of brick and stone masonry become accustomed to thick walls, to deep reveals at the windows and doors. And the time was when this was a necessity, the eye required it. This however is passing if not already passed. Steel is in such common use to-day that the mind is fully convinced of the stability of the thin wall, of the narrow reveal. Does it not see in the brick or terra cotta a thin fire-proofing shell? Does it not appreciate that within this shell lies the bone and sinew, the strength of the building in the form of steel construction? Again, good architecture of to-day is often spoiled by its surroundings, due to our economical ideas; land is too valuable, and occasionally to lack of thought or design, incongruous objects called buildings are crowded around what would otherwise have given delight. Observe the cathedrals of England how beautifully they nestle among the trees or rear their spires heavenward from the lowlands or again how imposing and boldly they stand on the tops of elevations of more hilly ground. On the other hand the cathedrals of France command attention because of their proportions, they dwarf their surroundings into insignificance.

The success of the building scheme of the World's Fair at Chicago was largely due, if not entirely so, to the design of the whole in harmony.

These were Classical buildings, but could they have been copied from a book? Were they mere copies? Certainly not, but rather did they display wonderful thought, power of design (inventive power if you will). The Classical idea and the harmony might have been attained if all of the buildings had been erected from the one design (copied from the one page of Classical reciepts). But their beauty was won because of their fitness for their work, because of the thought expressed in the design of each, because of the harmony in the design of the whole, and last, but by no means least, by the design of their surroundings. These latter were as carefully planned, studied and executed as were the buildings themselves. The extent and form of the grassy lawn, the water ponds with their alder banks, their reflections of the blue heavens and marble buildings, even to the ducks swimming on the surface, all was studied to produce an effect which displayed forethought and power of design that has seldom if ever been excelled, and which won from all sides the loudest of praise. Why is it that after this example so near home our Industrial Association did not profit by the lesson? Perhaps it is because the scheme at Chicago was so large. This, however, is no reason why we should not work in a modest way, but ever in the right direction. I have no right to speak except as an individual member of this Association, but I feel sure that we are willing to lend this or any other organization a hand with suggestions as to methods which will produce the best architectural results.

I have spoken of buildings as expressing thought and design when the ideas used may have been derived from a variety of sources, a statement which perhaps would be the better of an illustration. An individual may be a good mathematician and display thought even though he is using the fundamental rules of arithmetic or the laws of Newton. An artist may display thought though working with a simple palette he paints the same sky, sea and landscape as have been painted for centuries and yet their productions are classed as works of art, even though copied from such a universal book of art receipts. In the same manner an architect may design a building and display thought, etc., using ideas derived from the past.

Why do we admire the main building of the University of Toronto? Why is it that after passing that building day after day, year after year, we still admire it? Because it is more than a mere copy, more than a mere page out of our receipt book of Norman architecture. Is it not because it is a design, because it displays thought? It is a work of art and a lasting monument to one of our number who has gone to his rest. Here we have in the midst of our busy city a secluded quiet spot and in its centre stands a building, which seems to say to the noisy rabble and buzz of traffic—keep still! stand off! quietness is what is required for university life. As we stand viewing the building, resting on its grassy terrace from across the wide lawn, we observe its restfulness, grace and dignity. The entrance is well marked and inviting. Look at it where you will and the repellant and military feeling of the old Norman work have disappeared and in their places stand the thought, the design of the architect.

Look at the variety of the work, so varied in fact that every day seems to reveal something new. Observe the grouping of the windows how they mark the large halls, the smaller subdivisions of classrooms, etc. Now look at the round feature at the extreme west and see how well suited it is for the protection of valuable apparatus. The whole building unites to form a group, a unit of design, a picture which is indelibly stamped on the heart of every graduate as well as producing a lasting impression on every visitor too ur fair city of Toronto.

Mr. Paull: Mr. Wright's paper contains many valuable points. He names the University of Toronto as being a building which would attract our attention and bring forth our admiration. The University of Toronto has one advantage which other buildings in Toronto have not. It is in a position of isolation. Its beautiful form has plenty of room to show itself, and you can go and view the perspective of it from many points, and at every point you can see some new beauty. It is a great pity in my opinion that there are a great number of very fine buildings in Toronto lacking those conditions, and if there were more room surrounding them they would look very much better. Very many buildings built by the architects of the city of Toronto are cramped up and cannot be seen to advantage. For instance the Sick Children's Hospital, on College street, a fine building, but not having room enough to be seen to advantage. Now suppose that $100,000 was the cost of that building, and suppose that $20,000 were expended in taking down the buildings around it so that the building could be seen to advantage, would it not add very considerably to the advantage of the building and to the utility of the work, and create as it were an importance to the city of Toronto itself? Many other buildings might be mentioned that are so situated. Even our own City Hall has not sufficient ground around it to see it to advantage. If you go to Buffalo you will see that their City Hall is well arranged as to site and has plenty of ground around it.

Mr. Aylsworth: In regard to the Exhibition Building Competition, it strikes me as strange that this Association in some way had not been consulted by the managers before issuing the advertisement. It seems that the Association is not well known to the citizens. I don't know if there is any way that it could be made better known, but that is an instance showing the necessity for it. It seems to me that the members of the Association ought to have been more in touch with the Exhibition managers. It might be worth our while to appoint a committee to look after that sort of thing. If we had had such a committee something else could have been done. Perhaps it might be thought worth while yet to appoint one. The Exhibition Board I don't think should be permitted to go on and disfigure the city; they represent the city in some way, and the citizens should have some hold on them, and the architects should be sufficiently strong to guide the citizens. Just what shape that might take I cannot say. It seems strange that such a large number of architects should not have sufficient influence to have some weight with all such corporations.

Mr. Burke: Perhaps Mr. Aylsworth is not aware that the President called together some others of the Association, among whom were Mr. Eden Smith and myself, who went down and saw the officials of the association. I was not able to remain for the interview, but I understand that about all that could be accomplished was to gain consent to appoint experts to be selected from the Association membership. While Mr. Wright was reading his paper, I could not help noticing how the Americans went about the inauguration of their exhibition, putting it into the hands of competent architects and landscape architects. I do not know whether it is too late now to do anything towards guiding the Exhibition management into proper line.

Mr. A. H. Gregg: There are two instances brought before the Association, the Exhibition and the University buildings, where there has been a number of buildings erected one after the other. At the University the library was built in a splendid position, but with that exception hardly any of the other buildings have been placed with any regard to artistic grouping, and the Exhibition buildings have been managed in the same way. When our University was burned down, some landscape gardener might have laid out the grounds and allowed for coming buildings, and much better results would have surely been obtained.

Mr. Baker: Mr. Wright has referred in the early part of his paper to the difficulty of obtaining originality in our designs and the great danger and tendency there is towards plagiarism. I think if we look over the buildings of the United States it will appear to us that there is very little original work; that most of the large buildings have been designed along the lines of magnificent examples of architecture which have been erected in earlier periods. Are we in Canada really wise to attempt the original, or would we do better to adapt what we know to be good? It is a question which has been before us at all times, but is difficult to decide. Take the architects in the United States, and of course we have to turn to them, as they have always so much work at their disposal. Those who have tried to work along original lines have not succeeded; they have given it up and gone back to precedent. For example, some of the finest buildings recently erected in the United States are admittedly adapted from important European examples—Madison Square Garden Tower in New York, the library at Boston, the New York Herald building, and many others. I mention these without hesitation as they have even been published side by side with the Eurpean examples in a comparative way. I think architects should work together when designing and erecting adjoining or even adjacent buildings of all kinds. Petty jealousies often prevent good architectural effect. Last night we had a view of several New York buildings. I noticed in passing over the view one building which was perhaps an eighteen story building erected beside a twelve story building; evidently the taller building had been erected since the other, but the cornice line on the smaller building had been carried artfully around the taller building improving the appearance of both. Many examples could be named proving the advantage of consultation in the public interest, and I hope the influence of our Association will improve matters in this direction. With regard to the Exhibition we must not forget the state of architectural embryo the whole of it is in. The fact that Mr. Wickson and other members of the Association were asked to confer with the association and succeeded in having the conditions made as nearly satisfactory as possible should not be overlooked. It is true that the prizes are very small and look as Mr. Wright said, like "a bone thrown to a pack of wolves." But Mr. Wickson if he were here would explain to you that he admitted a certain amount of reason in this. It was thought the architects of the city of Toronto would be patriotic enough to enter into the competition and help on the city's welfare. It is true that designs are asked for individual buildings without any regard to the placing or grouping of them, and it is evident from this that the Exhibition Association has overlooked this, from an architectural standpoint, vital point. All of us who have given the subject any thought will realize what a splendid opportunity there is of grouping the buildings, spaces and courts, and even of introduc-

ing the delightful element so desirable at exhibitions, water, the vast stretches of which through the Chicago Fair gave the White City the delightful transparency and lightness, and the absence of which with the absence of music was the cause of the heavy, serious business-like appearance of the marvellous exposition recently held in Paris. Consequently I think it is to be regretted that this matter was not considered from that point of view. The large sum of money which it is proposed the citizens should expend there, ought to be well expended indeed if the placing of the buildings be properly handled.

Mr. Baker moved a vote of thanks to Mr. Wright which was seconded by Mr. Belcher and carried.

Mr. Aylsworth: It is clear to us all as Mr. Baker says that a splendid opportunity still exists for a thorough replanning of our exhibition grounds; not that great changes need be carried out at any one time, but that when money is to be expended whatever is done may be as part of a complete whole to be realized in the course of time. There is no body of men more competent to outline such a scheme than this Association; but in this business age something more than planning must be done. We must not only have an artistic and feasible arrangement to present, but it must be so placed before the executive body that there shall be no chance left open for its rejection. As our time is now perhaps too limited to fully handle the problem I propose that it be made the principal subject at our monthly meetings during the balance of this winter, first to develop such a scheme as the citizens cannot but be proud of, and then appoint such a strong and permanent committee to see it gradually worked out that the City Council Exhibition Association can never shake them off.

Mr. Wright: As the grouping of the University buildings has been referred to I should like to ask Mr. Dick what opportunities have been offered him in this respect. A difficulty in the way of a comprehensive scheme is the fact that there is continual progress in the aims of the University, and ideas which were accepted a few years ago are now in the process of change.

Mr. Dick: Regarding the University buildings a particular building was proposed and a particular site selected for it, and of course one would have liked to have carried out all the buildings in the same style as the University itself, but unfortunately this is a very expensive style, and the library is the only one that could be made to harmonise with the main building. It would have been a very excellent thing to have had a landscape gardener to lay out the whole buildings, but as Mr. Wright has pointed out, ideas have changed so considerably, that the ideas would have had to be modified as the buildings were erected.

Mr. Gordon: It might be interesting to note that the public are gradually getting educated on this question of grouping of buildings. The process is slow, but the college authorities are beginning to realise that the general effect of their buildings depends so largely upon their grouping, and I might mention that last summer I was asked to go to Kingston with just that object in view, to give an opinion as to what would be the best method of grouping the buildings, in view of the lack of effect from the McGill buildings, and to some extent the lack of effect of the Toronto buildings. The authorities recognized that although they were doing things in a modest way they might be planned ahead to get the best grouping of buildings, and that the whole would have the best possible effect, and it is a pleasure to see that college authorities are beginning to realise the importance of grouping.

Mr. Burke: Would it not be well to memoralise the Toronto Exhibition Association, and point out the pains the Pan American Exhibition people have gone to in the grouping of buildings, landscape architecture, etc.

Mr. Hall: You would have to send it to the city, Mr. Burke.

Mr. Burke: To the proper authorities, also give it to the papers, so that the public would see what was suggested.

Mr. Gray: I think Mr. President that would be a good idea. The existence of the Association is kept too much from the general public. There have in the past been cases right in our midst where the Association has been looked for by the public. Recently with regard to the St. Lawrence market buildings the public have looked round about aud said "Where is your Association, what are you doing?" "Where is the Ontario Association of Architects?" I think that the Association has been asleep during this last year and has lost opportunities and kept in the background when it could have been doing useful work. I feel that it is too bad that the public should have to look round about for the Association when these things occur. When this exhibition matter was brought up, too, we find the public asking "where are the Ontario Association of Architects, what are they doing?" and we have simply to shut our mouths.

Mr. Baker: Well, somebody ought to get up pretty quick. I would like to ask this Convention whether it was the Association or Mr. Gray that was asleep during the past year. Nearly every morning when I look at the paper, I see that the Association of Architects has done so and so. Certainly 10 or 20 times during the last year I have noticed this. We cannot hang a banner across the street from the doorway down stairs stating that the Association is to be found here. I would rather that the recent Kingston University competition were discussed than the exhibition. Perhaps, after all, the worst we can say about this exhibition competition is the prizes offered. If they do not see fit to offer a larger premium, we can appreciate that it is because they are tied up in every direction. Regarding the Kingston College buildings: Anything which has ever been placed before a body of professional men which would equal that in absolute lack of knowledge of decency in the procedure of engaging professional assistance, I do not think I have ever seen. If any action is to be taken to-day, I think it ought to be taken against that kind of competition. I think several of our members felt this very keenly. This is an instance demanding an explanation, but in the other I think we should rather do what we can to show our appreciation of what they have tried to do for us.

Mr. Gray: With all due respect to Mr. Baker's reference to the publicity of the Association in the daily papers, the Association is not known as it should be to the general public. Now I do not care what Mr. Baker says, it is a fact that the Association is not known as it should be to-day.

Mr. Baker: How should it be made known?

Mr. Gray: I think one of the methods is in using it in our own daily experience; using it from time to time; let the people know about it. I maintain with all due respect to Mr. Baker that it has not been brought sufficiently before the eyes of the public.

Mr. Aylsworth: Mr. President, I am glad to see a little discussion on the lines I intended to evoke, and I do not think this might be confined to exhibition or university matters. It seems to me that we might prepare for the press a little more extended notice of this Convention than has been done heretofore, and announce that a standing committee had been appointed, so that the public might know that the Association is prepared to consult with any such bodies at any time in future.

Mr. Gray: Allow me to give you an idea of that matter which I spoke of. When the St. Lawrence Market was brought before the Board, that Board turned round and stated that they did not really know of an Association such as the Ontario Association of Architects.

Mr. Gemmell: I don't know whether this discussion is on Mr. Wright's paper or not. The only suggestion which I see that would arise out of Mr. Wright's paper (laughter)—excuse me saying only, but I mean the only PRACTICAL one would be: I think that a proposed competition that the Exhibition could bring forward would be for a landscape garden plan, comprising the whole laying out and construction of the Exhibition, when, if they wanted to erect a new building, it could be laid down in a position making it a fitting part of a well digested plan to utilize the ideal site that would not ignore the effects to be got from that beautiful stretch of water, Humber Bay. I therefore think that what the exhibition wants most is a scheme for a whole. Their buildings now are not expensive. They should not be considered as opposing one grand scheme at all. They could be torn down or removed. Perhaps the Association would move in this direction of bringing forth a competition for laying out a scheme for the whole Exhibition, if properly brought before them.

Mr. Langton: I am always opposed to puffing the Association simply for the sake of puffing it. As a matter of fact the Association has been very weak for a few years for lack of support, but it has not been idle in matters where it could help the city. We have drawn up a complete and perfect set of building by-laws (which were ignored), intervened in the case of the Market Buildings, and have done everything we could do. If the City Council did not know of the Association it is certainly strange, especially in connection with the market competition, for both the Mayor and the City Engineer received letters upon the subject and had an opportunity of perusing a copy of our conditions of competition. On a certain occasion in the days of the old Guild—of blessed memory (laughter), we had a meeting over laying out the old Upper Canada Grounds, and had several schemes for laying them out. Why could not some of the monthly meetings be devoted to laying out the Exhibition Buildings in the grand style; and Mr. Wickson has already denoted to the Association that the city is willing to do something in the direction of assisting the Association in carrying out the buildings.

WEDNESDAY AFTERNOON SESSION.

The convention having re-assembled, Dr. P. H. Bryce, Provincial Health Officer, presented his paper on "Problems in Maintenance of Purity, Equability and Moisture of House Air."

PROBLEMS IN MAINTENANCE OF PURITY, EQUABILITY AND MOISTURE OF HOUSE AIR.

GENTLEMEN:—It was with some diffidence that I complied with the request of your Committee to read a paper before a society composed of gentlemen who are daily engaged in dealing with the practical details of house building, and I must appeal to your indulgence if in my remarks I betray an ignorance of practical details which are to you but the alphabet of your work. My excuse for attempting a paper at all has been due, however, to a conviction growing out of my observation, that we are, in matters of ventilation and heating, not living up to our knowledge. For instance, last summer the Ladies' Committee were arranging for the heating of a mission church, and I asked them what arrangements for ventilation were included with the furnace. They answered that they did not know, but supposed that the furnace dealer would see to everything. However, I was asked to find out, and learned from one of our prominent makers that no provision for fresh air was in the proposed tender, and that it was intended to draw the air off at the floor back to the heating chamber around the furnace. When I protested that surely they were not going to make the people rebreathe the air, I was told that not one furnace in five in the city nowadays provided for anything else. If such be the case, and if the term "economy" is to be applied to furnace heating performed after this fashion, then, indeed, it would seem high time that architects and sanitary officers place this matter in its true light before the public, and insist on the application of the true remedy.

The problem of how to heat economically and yet efficiently has been, and is, both a complicated and difficult one, owing to the many circumstances of latitude, exposure, nature of employment of inmates, number of occupants of dwelling, and so on, and yet there are some primary principles which must be fully understood if even a moderate degree of success is to be attained. I shall attempt to outline these in order of importance as they appeal to me.

Owing to the constant atmospheric movements of external air it must be remembered that the external air is, even in cities, infinitely purer than the best house air under ordinary conditions. For instance, Dr. Paul Regnard quotes a table from Miquel giving the bacteria per cubic metre in air as follows:

Air over the Atlantic	0.6
Air of Paris at summit of Pantheon	290
" " in Rue de Rivoli	3,480
" " in a new house	4,500
" " in the sewers	6,000
" " in an old house	36,000
" " in the hospital de la Pitie	79,000

Or as Regnard says, a patient in La Pitie inhales 790,000 bacteria daily.

As regards chemical constituents, Dr. Angus Smith, Saussiure, Muntz, and others, have found that the carbonic acid of the purest and most impure outer air does not vary more than between 2 and 4 parts in 10,000, whether on mountain top or in the slums of great cities. To illustrate further, Pasteur and Tyndall both found that sterilized solutions of beef bouillon, could not be exposed a moment in a room without danger of infection by some floating microbe, while on the mountains outer air was practically sterile. Clearly, then, our problem involves the introduction into houses or living rooms of a reasonable amount of outer air, if we believe that fresh air is necessary to health. Now it is quite apparent that we are at once contronted with the question of how to do it, and how to pay for it. After much consideration, I am convinced that it is possible, with reasonable economy, to keep house air fresh, but only by an appreciation of the several physical laws entering into the problem.

First, the construction of a warm building—this is our first point. But some one says, here again it is a matter of cost. Partly so, and only partly so. Practically we have three building materials, stone, brick and wood. Speaking of refrigerating machines, Leask remarks, that a large percentage of the actual work done is required to make up for the transfer of heat through the walls, floors and ceilings, occasioned by poor insulation, which amount may be measured experimentally. Tables are given as illustrating the varying conducting powers of substances. Prof. Shaw, of Cambridge, indeed gives a formula for estimating the amount of heat lost in one hour by conduction through an area of one foot square of different substances of one inch in thickness, with a difference on the two sides of from one per cent. upwards.

Copper conduits	3225.0 units.	Cork	0.90 units
Iron	477.0 "	Water	5.82 "
Stone	17.0 "	Air	0.16 "
Brick	4.3 "	Glass	6.66 "
Oak (across fibre)	1.70 "	Slag wool	0.314 "
Brick dust	1.00 "	Asbestos	same as above
Coke	0.99 "	Paper	0.20 "

It is thus apparent that enormous differences exist in the conducting powers of our several building materials, and that very important facts regarding the conducting powers of other substances may become of practical service to us under many circumstances. Thus, Leask gives several examples, of which the following illustrates the successful arrangement for a refrigerator wall.

Outer wall, 14" of brick.
Next inner wall, 4" of pitch and ashes.
Next inner wall, 4" of brick.
Next inner wall, 4" of air space.
Next inner wall, 14" of brick.

But assuming that we are to build an ordinary 14" wall, we must see that two points are well attended to (a) that the mortar is laid so that the wall is not a seive, and (b) that its inner surface is grouted, and a good stripping is laid on tar paper, with an air space between this and the plaster, and thereby get at least some of the non-conducting conditions we are seeking.

But the question will be asked, what difference can the wall make if the air is to be frequently changed? An example will probably best illustrate the case. Assume a room with two outer walls of 30 ft. each by 16 ft. in height, and one ft. in thickness. This represents 900 square ft. of external radiating surface. Assume that one inch thick with one degree of difference between outer and inner air means in heat a loss of 4 heat units, one-twelfth of this is lost with a foot in thickness, or 300 heat units per hour. Let the difference in temperature be between 69° Fahr. and zero, and not only will there be a loss of sixty times as many units of heat, but the rate of loss of heat is directly proportional in rapidity to the difference between the internal and external temperature. But assuming that this most important matter of making a building warm, compatible with moderate first cost, is accomplished, we have still the problem of its heating. It is apparent that houses, essentially dwellings, must most concern us. Warehouses and similar large buildings, are usually filled with goods rather than people, but schools, workrooms and factories, as well as dwellings, must claim our attention.

It has always appeared to me that the large buildings with many inmates is our simplest problem, since the means applied may be mechanical and caretakers may be provided to supervise such. But I think it will be common experience when I say that the idea of introducing adequate air while installing our heating apparatus has hitherto been given relatively but little thought.

Take the heating of a school or church, for instance, and we have hot air furnaces, steam and hot water, to choose from. Suppose it be a hot air furnace which is chosen. Air is introduced into a school room at from 100 to 150° Fahrenheit at a single point, with its moisture reduced by expansion of the air to perhaps ten per cent. or less of relative humidity. It is delivered at one point often creating a draught, and a chimney register of a few square inches area is usually the only exit. Analysis shows the carbonic acid relatively in excess. Windows, if open, again subject the inmates to the danger from draught, and so are only occasionally opened. If the heating be steam we have heat alternately in excess and defect, while the likelihood of getting a fair amount of moisture into the room, and a fair degree of purity, is seemingly very slight. In the case of hot water heating, we have in the regulation of the degree of heat in the rooms many advantages, but in the matter of air purity the same problem of how to maintain a reasonable purity of air is quite as prominent as in the case of steam. In both cases it is not uncommon to have fireplaces in rooms, and in such instances a fair degree of purity is naturally maintained by the chimney shaft, greatly increased, of course, if a fire is kept in the grate, although the air near the floor is relatively cold in consequence of the draught from beneath doors leading to cold halls and the outer atmosphere.

The question, therefore, before us is: Can we, with the ordinary means at our command, improve the air conditions in the living rooms of public or private dwellings without an increased expense? I believe that we can, and I propose to deal with some of the methods and explain the reasons for my opinion.

Suppose that we have to deal with an ordinary school building. What methods should we pursue to effect the desired end? I shall assume that the walls have been made in a large degree non-conducting. In a school building of four rooms, each providing for

fifty pupils, and giving 240 cubic feet, or 4x4x15 feet to each, it is found that 2,000 cubic feet per pupil per hour will keep the carbonic acid at 6 parts per 10,000. In order to supply this, 100,000 cubic feet of air per hour must be passed into each room, whose cubic capacity is 12,000 feet. This means 8⅓ changes per hour. To supply this an inlet shaft 2x2½ feet is required, which delivers air at 6.94 feet per second. It is found that air coming into the room at this rate, at a point above the head, say 7 feet from the floor, with the mouth of the delivery duct at an angle of 45 degrees, will cause the air to distribute rapidly laterally, while the vis a tergo, or head, and the temperature at say 80 degrees Fahr. will cause the air to rise and be propelled across the room, where reaching outer walls it will be cooled and will descend and return at a rate not exceeding 2 feet per second along the floor towards an exit shaft, which should be at the floor near the inlet. To favor even distribution the windows should be double and the walls non-conducting as far as practicable. In order that this work be done, the air must be previously warmed, in the cold air room of the basement, and forced into the shaft by a fan or drawn in by heated extract shaft. The method provides a very important means of supplying outer air as it is warmed, with an opportunity of receiving moisture in the cold air room from broad and shallow evaporating pans supplied with water automatically by a ball-float and valve. To illustrate the importance of this point, some figures may be given. It will be remembered that as air expands with heat, its capacity for moisture increases. The percentages of moisture at different temperatures have been calculated. Thus at

0°	Fahrenheit	= Moisture	= 0.09 per cent.
32°	"	= "	= 0.37 of 1 per cent.
42°	"	= "	= 0.56
52°	"	= "	= 0.81
62°	"	= "	= 1.17
72°	"	= "	= 1.68
82°	"	= "	= 2.36
92°	"	= "	= 3.28
102°	"	= "	= 4.54

Thus the relative humidity of air more than doubles with every twenty degrees, proportionately increasing with increasing temperature. Now, it will be further noted that air in motion practically never becomes saturated as it passes over moist surfaces, but takes up probably 75 per cent of saturation. Hence, outer air at 0 degrees going into a room, we shall say, at 90 degrees, will at 75 per cent of saturation have taken up ten grains of vapor, or it will hold thirty times as much moisture as that in outer air at zero. In other words, the 100,000 cubic feet of air hourly introduced into a school room should be supplied with 1,000,000 grains of water, as vapor, or it would actually take up through evaporation 13 gallons of water hourly. As however, the moisture from the breath of children yields a very notable amount of moisture, we may say ten gallons of water ought to be provided hourly. This amount seems enormous, and would seem to actually use up heat. But the heat is never lost, it is only latent, and the service rendered by the moisture is apparent. If the air goes into the room too dry, and I am informed by Mr. Stupart of the observatory, the air of the house heated by an ordinary hot air furnace, has a relative humidity of not more than 25 to 35 per cent even with a good evaporating pot, it is apparent that the air must, from every available source in the schoolroom, seek its moisture. This it gets from walls and furniture, but especially from the mucous membrane and skin of pupils. Now assume that this 100,000 feet of dry air becomes even partially saturated, and I have found it in a school room heated with Smead Dowd furnace, at 50 per cent of saturation, it is apparen that it will in an hour have removed a large amount of moisture from the bodies of the pupils. But to evaporate one pound of water requires nearly 1,000 units of heat, and hence it is apparent that even if two pounds of water were given off by the breath and bodies of fifty pupils per hour, 2,000 heat units would be utilized. But very much more is lost by insensible perspiration. Now the practical point is this, that since the body temperature is 98.4 degrees F., it is apparent that the air of a room does not warm the body, but only prevents the loss of heat aided by clothing, with too great rapidity and as evaporation produces cold, the lower the air is the more rapid the loss of heat by evaporation, and hence the constant experience that in rooms with dry air a temperature of 70 to 75 degrees is required to prevent a sensation of cold, whereas if the air held more vapor much less loss of heat would take place by evaporation and the sensation of cold at 60 degrees F. would not be as great as in the other case at 70 or 75 degrees. Indeed, we all know that in English text books a temperature of 60 degrees F. with the common fire-places of that country is set down as a normal house temperature, due to the moist air constantly brought into the room by the draft. I have dwelt upon this point at some length, because I am convinced that more injury is being caused by the abnormally dry atmosphere of our houses than from any other cause.

This matter of reducing the temperature of a living room further bears a very important influence upon the question of economy in heating. If we assume that outer air brought into a cold air chamber is at 15 degrees F., then it will require every hour in the school-room referred to, some 10,000 heat units to raise it to 70 degrees F. or 55 degrees; or nearly 25 per cent. more fuel is required than is necessary to raise the air to 60 degrees, if the heat rendered latent by evaporation be not considered. As some 35 pounds of coal per hour with a loss of 20 per cent. by the chimney is theoretically required to heat a room up to 70 degrees under the conditions we have assumed, it is apparent that the matter is a most important one for consideration.

In this connection, it seems of importance to refer to the part played by radiant heat as an adjunct to room heating. All are aware of the effects of the heat from a grate, but we are not so conscious of the effects of the heat radiated from steam and hot water pipes. We speak of heat waves and are aware of how relatively different are different liquids, solids and gases, in their power to absorb rays of heat, and that amongst gases, the oxygen and nitrogen of the air are non-absorbers of heat, whereas, as Tyndall informs us, the absorption of heat waves by water vapor is the chief agent in preventing the earth from becoming barren from the loss of the heat absorbed by the earth during the day. Probably from 10 to 15 per cent. of the heat radiated from the earth is absorbed by the water vapor within 10 or 20 feet of the earth's surface. Such air, too, plays an important part in the absorption of heat in the air of a room when the air has its proper amount of moisture, while further the penetrating powers of the heat rays from radiators and grate fires by which the bodies of occupants are warmed, are well known. Another point of importance in this connection is the fact that a white wall reflects the heat to a much greater degree than dark walls, although not absorbing heat readily itself, and the black steam pipes are much better radiators than if painted white.

We have dealt with some of the physical laws entering into the conditions affecting the heating of the air of rooms, but I have frequently thought that the construction of our houses, which usually have open stairways on three storeys, might be dealt with in a much more economical manner than is usually practised. Most of us know that in a single room, say on the ground floor, the heat near the ceiling is 10 to 15 degrees higher than at the floor, and for the same reasons the air of the lower floors constantly ascends as by a funnel to the upper rooms. In such cases the remedy applied usually is to have a hot air register or a hot water radiator in each room.

Some of our economy hot air furnace manufacturers have, however, seized upon a familiar fact, namely, that by drawing off the air at the floor by a down draft shaft leading to the warm air chamber around the furnace, not only is the air led more equably in each room, but the warm air is kept near the floor of the room and they have with much success solved the problem of equal distribution of heat and economy in the use of fuel. The fatal defect in the system is, that they are re-heating the air already breathed and violating the very first principles of introducing pure air by a fresh air duct in the living rooms. Now, it appears to me that we may make use of the principle of maintaining an equable distribution of heat in the manner referred to, while at the same time utilizing the fresh air shaft by arranging floor ducts so as to lead the foul air from the room into the ashpit of the furnace, with a damper which will turn this foul air into the smoke flue as a cheque draft in mild weather. Indeed I have had this done with much success in the Mission church referred to, insuring a very good ventilation with an excellent distribution of heat in an oblong building.

With regard to the question of moisture, not only can a series of shallow pans in the heating chamber of a hot air furnace be supplied, but evaporating pans under each register may, with advantage, be utilized for still further supplying moisture to air which is abnormally dry.

But dealing with the problem as regards the most practical method of heating a private house and at the same time supplying fresh air there would seem to be no question but that the heating with hot water most completely supplies the several requirements. In the sleeping rooms radiators may be placed, while the window is drawn down, and a draft prevented by a drawn blind fulfills every requirement. For the living rooms each should be supplied with a radiator, while fresh air would be brought into a cold air room in which is a series of radiators over which shallow pans are placed with an automatic supply of water while there will be delivered by the indirect method an ample supply of fresh warm air with adequate moisture for maintaining the air of the room at a normal humidity.

The question of steam heating for large buildings naturally must be considered, and in the matter of economy of installation leaves little to be desired. But except as a means of heating fresh air to be supplied by ducts with a fan, it presents all the difficulties of lack of ventilation and dryness of air which have been already referred to. When thus utilized with small radiators in rooms as supplementary heating in very cold weather, it probably is the most readily applicable of all methods, but the disadvantages of heating houses by radiators are numerous, and cannot be said to be a desirable method of heating, while defective in the total absence of adequate ventilation and supply of moisture. Equability of temperature is not possible, while the cracking due to condensed steam is most undesirable. Probably the ideal method of heating such large buildings is that where steam pipes are used for heating cold air to be delivered by fans with adequate exit shafts, while the steam is carried to coils placed in tanks of water at convenient points for each suite of rooms, from which hot water pipes are carried to the coils or radiators which heat the several rooms as a supplementary means of heating. I have, however, referred to some of the many difficulties no doubt experienced by all, and have touched upon some of the possible remedies. One, however, must recognize the difficulty of having remedies applied. In too many cases we have to take what is in the market, and as I witnessed last year, in some specifications for school buildings, the details were left so indefinite that it seemed likely to become a question of what furnace manufacturer could satisfy a trustee that he could get enough of heat into the building, and not whether they would be ventilated when heated. It does seem very essential that at any rate in public buildings not only should there be laws defining certain necessary conditions before school buildings, &c., could be constructed, but that, as in Massachusetts inspectors should be employed to examine the proposed methods of heating before they be installed.

The President, resuming the chair, spoke in appreciation of Dr. Bryce's paper, and said he hoped Dr. Bryce would tell the meeting in concluding the discussion, if there were any simple methods by which the quantity of moisture in air can be tested.

Mr. Burke: I am almost dumfounded at the amount of moisture necessary to keep a room in a satisfactory condition. I thought when my furnace was evaporating half a pail of water a day I was getting a splendid amount of moisture in the house. With regard to the practice of the hot air furnace men of drawing all the air from the house, instead of from outside, it is almost suicidal. Another arrangement I have in my house which I think is a good thing—I have exhaust registers in rooms where there are no fireplaces. They are set close to the floor and are carried to flues in the chimney stack which are warmed by the furnace and kitchen flues. I find they are acting in a very satisfactory way.

The President: I am glad to say I can go one better than Mr. Burke, I evaporate in my furnace one pail of water a day, but I confess that is one-fifth of what I ought to do.

Mr. Dick: In dealing with a question of this nature architects are generally confronted with the question "what is it going to cost?" I recently noticed an article in the American Architect with regard to the cost of ventilation, and I should like to read it. The article is a portion of a lecture delivered by G. A. Suter before the Engineering Society of Columbia University:

"The total cubical contents of this room are 30,000 cubic feet; the total direct radiating surface in the room is 350 square feet, and the total steam consumption or proportionate boiler capacity required for the heating of this room in zero weather is 3½ horse powers. The moment, however, that you ventilate this room, renewing or replacing the air six times each hour, supplying 180,000 cubic feet of fresh air per hour, we require not less than 9 horse power of steam, when the outside temperature is at zero, to warm this quantity of air from zero to 70° F., or room temperature, and in addition thereto, 2½ horse-power for the mechanical effort required to move this quantity of air in and out of the room. Therefore, out of the total of 15 horse-power that are required for the heating and ventilating of this room, only 3½ horse power are required for heating while 11½ horse power are required for ventilation. Similarly, out of a total of 3,550 horse power required for warming and ventilating these buildings in zero weather only 560 horse power are required for the direct heating, while 2,990 horse power are needed for ventilation. When the out-side temperature is higher these quantities are correspondingly less, except that the motor power, of course, remains constant. For example at 35° outside temperature, out of a total power of 2,017 horse power, the direct heating requires 280 horse power, the ventilation 1,102 horse power for heating the air, and 635 horse power for motive power, or 1,737 horse power for both. The proportionate amount of power for ventilation, as compared with the total power, increases as the outside temperature increases, and, as our average temperature during the heating season is not far from 35,° it is fair to conclude that the ventilation of these buildings costs about six times as much as the heating. This gives us a clear illustration of the cost of ventilation, and an explanation of why, even when the apparatus is provided, the ventilation is somewhat curtailed. We sometimes wonder why our public buildings are not better ventilated, but the explanation, when it is not due to ignorace or incapacity, is found in the expense of the apparatus and in the expense of operation."

In buildings in which the ordinary fan system is provided for exhausting the air, and having a certain amount of direct radiation in the rooms and a certain amount of indirect in the basement for the purpose of warming the fresh air, I have noticed that the whole system of ventilation is often allowed to fall into disuse. For instance, the manager of a bank once asked me if I could not make an opening into his room to get some fresh air into it. I said, "You have a fan; do you use it?" He said "I really do not know. I must see about that." There are some buildings in this city which have excellent systems of ventilation and in which the ventilation is notoriously bad, and I am told that the reason the ventilation is bad is that the apparatus is not used simply on account of the cost of the power for running the fans, and also of the increased amount of fuel necessary to warm the fresh air that must be taken in to replace the foul air taken out. In regard to actual temperatures, I have noticed that with a steam radiator in a room I feel much more comfortable with the temperature at 60° than if it is higher, but when there is no direct radiation in a room, without direct radiation one is apt to feel chilly even if the temperature is a good deal higher. The automatic water supply that Dr. Bryce recommends is an excellent idea, but I confess I had no idea of the large amount of water that is required to properly moisten the air in a room. There is one point I might mention with regard to this: I noticed in my own house that when the water was doubtful (as it has some times been in this city) there was a very objectionable odor in the house, but after awhile I discovered that it was caused by the gradual accumulation of filth from the water at the bottom of the evaporating pan, and a very objectionable odor was sent up into the rooms.

Mr. Edwards: I would like to mention here one thing that has come under my own observation. I once or twice went on a little exploring expedition a year or two ago after having seen a ventilating apparatus in successful operation, and found steam shut off from coils in ventilating stacks and fresh air inlets closed up, and on mentioning the matter to the owners have been told that it was a pity I had not looked around sooner, as they were not aware that the ventilating appliances were not in daily use. In these cases the caretakers had shut off the fresh air and closed up the ventilators simply to save themselves the extra labor in firing up. I believe this sort of thing is more common than one might suppose.

Mr. Langton: The reason why the hot air heaters object to the cold air duct is that to them a cold air duct is a cold air duct. A standard size does for houses of very different sizes and is usually too large for any house. As a matter of fact the cold air duct should be proportioned not so much to the house as to the number of people in it, and it takes a very small cold air duct to supply an average family of six with the 3600 cubic feet per head per hour that the tables of ventilation require, the law being that air enters through the aperture of a duct between outside air and inside air at a rate which is equal to that a body would attain in falling through a space equal to the difference in height of a column of the outside air and a column of the inside air if equalized in density, therefore in cold weather the air enters at a fast rate, and in mild weather at a slow rate, so that in cold weather a much smaller duct is required than in mild weather in order to supply the same quantity of air. I have calculated that for the average family of six a cold air inlet need only be 7″ x 12″ when the thermometer is 40° outside (accepting the inside standard of 70°), and may be reduced to 4″ x 12″ in zero weather. If our ducts were made of sizes carefully regulated according to need they would not be found to cool the house too much. There is something which Dr. Bryce said which I do not understand. The great point made, and a great part of the argument was, that if moist air surrounds our bodies, the radiation from the body is less, and therefore the body is more easily kept warm. How is it that in the North-West where it is so dry they say that 40° below zero is not felt as much as a much higher temperature is here?

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AGENTS FOR CANADA

Mr. Kay: Mr. Chairman, it seems to me that this question of ventilation that has been discussed, goes beyond the limits of what is practical. The idea of taking a cold air duct and putting it under the furnace! What would be the consequences? Why, the fire would be uncontrollable, you would be roasted out. The moisture in the air would be burned up. I think there is a great deal of common sense in the use of an interior cold face when it is placed near the front door. The air at that part is cold; every time the front door opens there is a great deal of fresh air comes in which goes down the cold air pipe, so that there is plenty of fresh air supplied in the course of a day. I find by experience that warm air ducts must be on the inside, in some internal partition, in a brick partition; if we have not a brick partition we must make them out of tin.

The President: In regard to that point of too large an amount of supply of air to the furnace, you need not use all the air, but divert part of it into the smoke pipe.

Mr. Gordon: I don't know, Mr. Chairman, how long time you wish to devote to this discussion, and I think it is proper at this stage to very enthusiastically and heartily move a vote of thanks to Dr. Bryce for the very instructive and practical paper which he has given us. In common with a great many others here I have been thinking of my past sins and making promises that I am going to do better in the future, and that in itself is a good thing for the doctor to have secured. I am sure we will all remember the impetus he has given us. I am impressed with the large amount of moisture required. I have been trying for two or three winters in my own house a plan of supplementing the evaporating pan at the furnace, (which, by the way is nearly always placed too low down to render efficient service) by suspending ordinary two quart tin cans under the floor registers and having them filled each day. It is astonishing with four or five of these in a house, what a large amount of water you can evaporate. However, I was just thinking, in fact I was speaking to the doctor before coming in here of the way in which the present generation seems to be enfeebled and subject to disease more than our fathers and grandfathers used to be. We have our houses built so much better than they used to; we fit our sash so much tighter; we try to save fuel in that direction, and make our houses as hot as possible. We put in hot water heating apparatus, and in many cases without any indirect radiators and fresh air inlet. I have been insisting (even with small apparatus) on having at least one indirect radiator under the hall. I have been trying a plan of putting a pan over the indirect coil under the hall and a water pipe brought there, so that by turning the tap a little every day that pan could be kept full. But since I have been learning of the immense amount of water required, I have been considering if it would not be desirable to have upon that a ball cock, so as to keep the pan automatically filled.

Mr. Belcher seconded the vote of thanks. I am a friend of Dr. Bryce. I noticed that he spoke of the low rate of diphtheria in my native country. Possibly he may recollect that the winds are from the west and they blow from the Atlantic right over the country. Of course we get the moisture from the ocean saturated with salt, and that coupled with the fact that we have no furnaces, and there are no heating apparatus but the fire-places, may account for it. Where in every room there is a fire-place, and the fire is kept burning in every room, it is impossible to get heat without at the same time getting ventilation and an abundant supply of fresh air which in Ireland is moist.

Mr. Baker: In attempting to speak to this immense question, I find my mind in a most chaotic state indeed. The paper I think is the best paper we have ever had. It is practical from beginning to end. We cannot fail to understand it. It brought out, for my part, the points I have been trying to get at through reading, and has condensed for me a great many books. Taking the tables which have been put upon the blackboard by Dr. Bryce, in the first column we find that a person who is run down should take a sea trip as we see that the air in mid-ocean contains only .06 bacteria per cubic meter. Following that down I am staggered by the figures, when in the city of Paris 36,000 bacteria per cubic meter are given off by an old house. Now that should be advertised; that is a point for us, sir. We have a reporter here, and he should devote a column to that. It makes it clear that we should not live in an old house, that we should have a new house! Taking the next paragragh on the black-board it would appear that we ought to live in wooden houses if we are to live economically. I also would think that perhaps a wooden house would be more wholesome to live in. It is very interesting to note the different points brought out there of the different powers of conducting heat, of the several materials. Passing on to the question of moisture, we have another peculiar proposition, that is this: We find that in London since artificial means of heating rooms other than fire places have been introduced, the ratio of diphtheria cases has greatly increased owing to a sufficient amount of moisture not being supplied. Now it has been pointed out to us that the residents of Ireland who have only fire-places are all in old houses. The individual who lives in the old house has more moisture and more microbes, while the man who lives in a new house has less moisture and fewer microbes; a choice of two evils with the benefit of the doubt in favor of the new house; henceforth we should see that he gets the necessary moisture. Dr. Bryce referred to painting of radiators. I think we all know that bare iron radiates heat more than that which is in any way finished outwardly. I remember on one occasion when I travelled up to the park to speak to Dr. Bryce on this question of heating and ventilation, he described an ingenious device which he had successfully used to equalize the temperature of the air throughout the room; if he has time perhaps he will describe it to you now, as I am sure you would be interested.

The President: We have this motion before us. I know Dr. Bryce will recognize that although it is a formal motion, it is one that is sincerely made. I am

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Dr. Bryce: Mr. President and Gentlemen: I know your time is limited, and I am sure you have had quite enough from me without discussing the points that have come up, yet there are several that need to be answered. The ventilation especially in the schools in the city of Toronto, attended by 35,000 children, is criminally neglected. Naturally one gets interested in the question. After all a health officer is not a health officer until he runs into actual contact with all the problems affecting the health and comfort of all the citizens, and that is what I have been trying to do for eighteen years, and in the question of ventilation, I may say that this generation in my judgment, is farther back than it was eighteen years ago. We recognized years ago that there ought to be an honest attempt to get outdoor air into rooms; to-day we have forgotten it, and we have been led into the idea that a hot air furnace may be allowed to give us the same air over and over again. I have pointed out in the table which Mr. Baker has referred to the relative purity of air outdoors and in, and if we have many diseases of a communicable character, that the number of germs in a house is an important factor. It is further true that an old house which has been accumulating dirt for a number of years must necessarily be a dirty house. Undoubtedly a hospital is a dangerous place to try and get well in. I recognize the point that Mr. Dick has brought up with regard to cost. No one can doubt that in this country. I am as convinced as I can be of anything that if we realized that the air which is up there at the ceiling is 15° warmer than it is here, that we would endeavor to economize by adopting means whereby it may be kept near the floor thereby economizing heat. Mr. Langton says that a person in Calgary is not supposed to feel the cold there as much as in Toronto. It is perfectly true, and if Mr. Langton will watch these figures for a moment he will see a partial explanation of the fact. We have got a loss of heat from the body. As we all know moist air conducts heat rapidly while dry is a non-conductor. Further, if it be remembered that the air of Calgary is usually dry and cold, capable of holding very little moisture, we will see why a man's body does not lose much by evaporation. If I have aroused an interest in what seems to me to be a very practical subject, I will feel myself compensated for any trouble I have had in preparing the paper. There is a practical question asked by Mr. Burke which I neglected to answer. He asked how we are to find out the humidity of rooms. You need only to arrange the ordinary dry and wet ball thermometer and with a set of tables may determine the relative humidity readily.

Mr. Burke: Can you introduce too much moisture in winter?

Dr. Bryce: If you get up beyond 75 or 80% you would probably have too much, because you are going to lose heat unduly by a damp air. The difficulty is the other way, because in all artificially heated houses we do not get the moisture.

Mr. President: I think that it is a generally understood thing that we do not confine our members on the Council to the city. There is just one difficulty that if we get too many outside of the city we have a difficulty in getting a quorum. There have been generally two members of the Council who are not Toronto residents.

Mr. W. R. Gregg: Read letters from Mr. Dick and Mr. Gouinlock withdrawing their names from the list of nominations for Council and from Mr. Baker resigning from Council. Under pressure Mr. Baker withdrew his resignation.

The election of members of the Council was then proceeded with, resulting in the election of Messrs. Edmund Burke, Lawrence Munro, of Hamilton, and Eden Smith.

The convention then closed.

At a subsequent meeting of the Council the following officers were elected:—President, Grant Helliwell, Toronto; 1st Vice-President, F. S. Baker, F.R.I.B.A., Toronto; 2nd Vice-President, John A. Pearson, Toronto; Treasurer, W. A. Langton, Toronto; Registrar, W. R. Gregg, 94 King street west, Toronto. Council:—Fred Henry, London; A. H. Gregg, Toronto; Lawrence Munro, Hamilton; Edmund Burke, Toronto.

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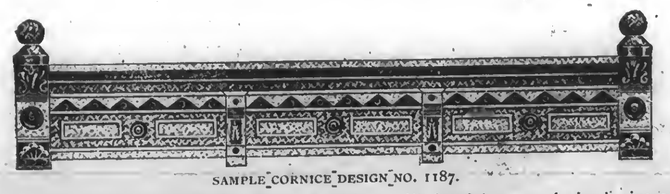

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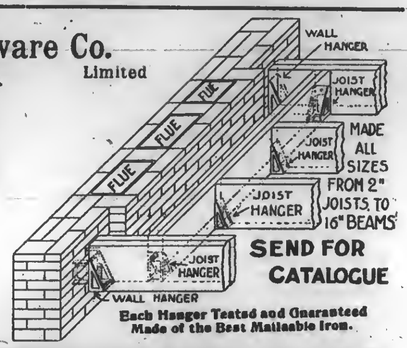

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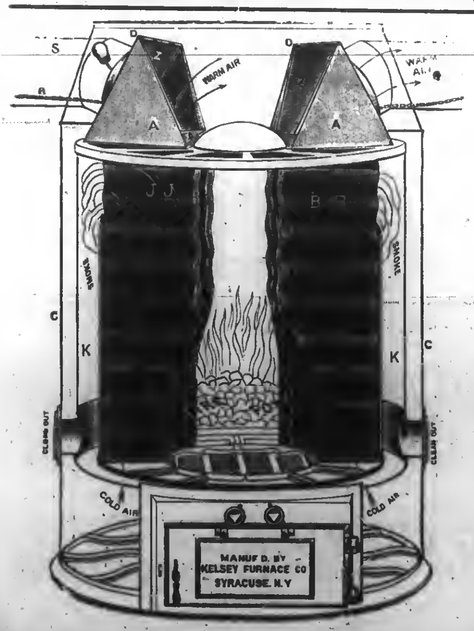

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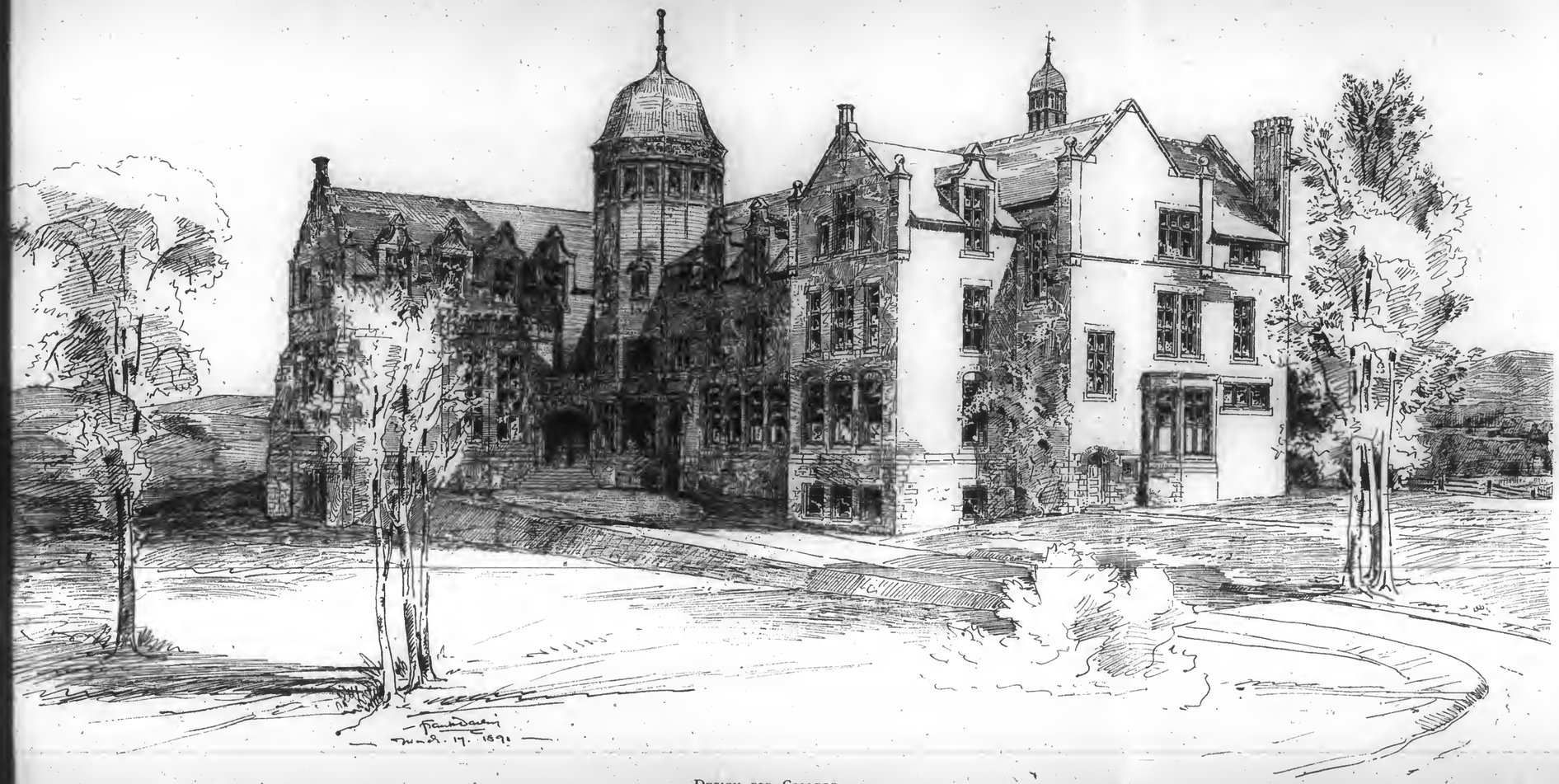

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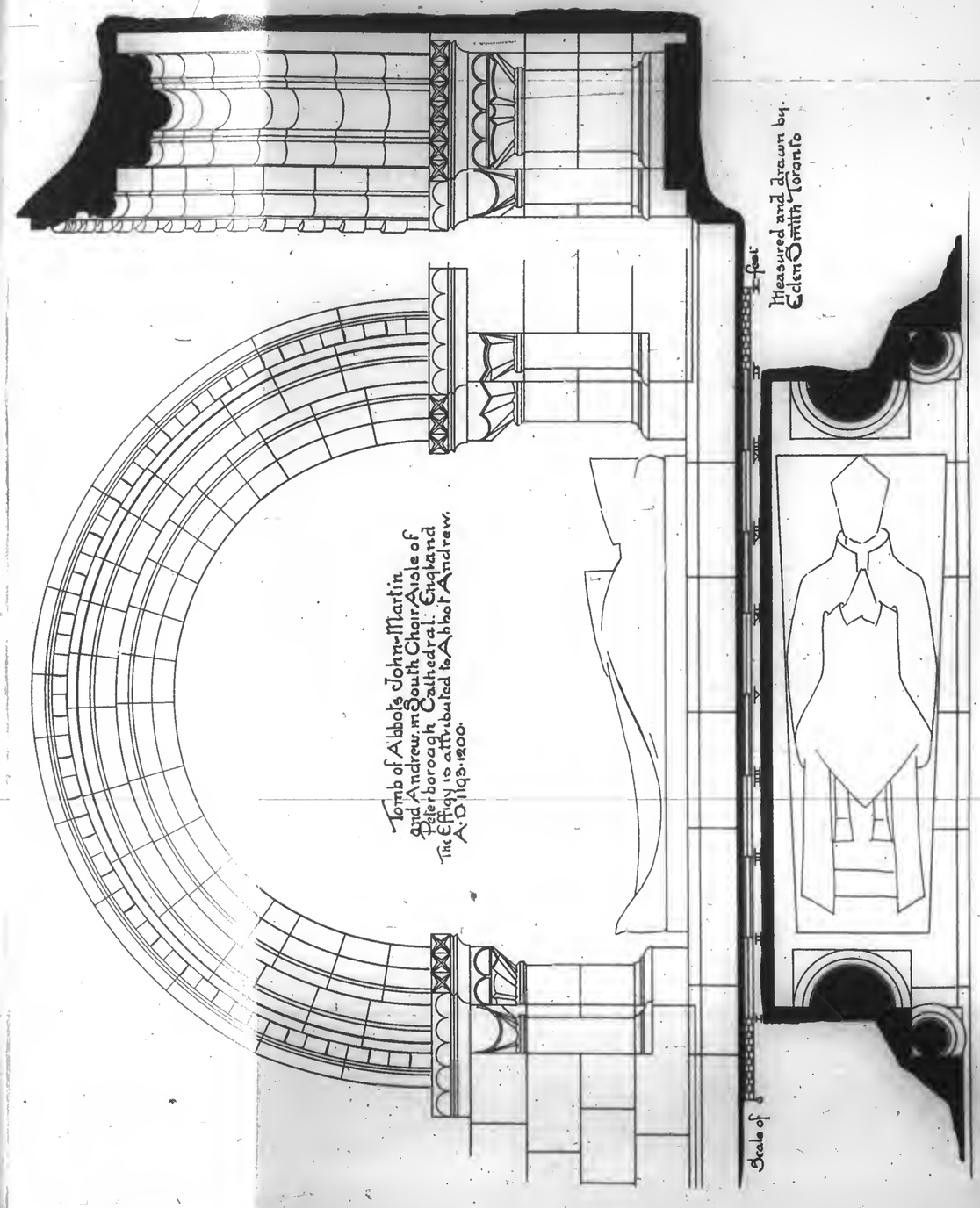

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Accepted Design for Proposed New Toronto Hotel—Henry Ives Cobb, Architect.
Illustrations accompanying Paper by Mr. G. A. Reid, R.C.A., on "The Summer Cottage and Its Furnishings."

CONTENTS.

Supplies for South Africa 49
Financial Result of the Paris Exhibition 49
The School of Practical Science 49
A Dominion Exhibition 49
Fire Escapes 50
Methods of Heating in Relation to Health and Economy 50
The Commercial Position of Great Britain 50
Reducing the Fire Loss in Building 51
Students' Department—Toronto Architectural Eighteen Club—A Twentieth Century Architect 52-53-54
The Summer Cottage and its Furnishings 55-56
Personal 57
The New Toronto Hotel 58
An Important Competition 58
By the Way 58
Examination for Architects 59
Montreal Correspondence 60
Manufacturers and Materials—The Maritime Clay Works Company — The Composition of Some Canadian Limestones 61-62
A Correction 63-64
. 65

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Supplies for South Africa.

THE quantity of food and other supplies required by the British Government for the South African campaign is enormous. Many classes of supplies, such as canned goods, hay, cheese and bacon, flour and salt, portable houses, wagons, bicyles, axes, etc., Canada could supply, but the bulk of the orders seem to go to the United States. As an example the war office is said to have just contracted with a United States firm for 3,000 axes. We have given British manufacturers a preference in our market, and should have a claim to British orders for products which can be as well supplied by Canada as by the United States. If the British Government are ignorant of our ability to supply many of its requirements blame attaches to the Dominion Government, and no time should be lost in putting before the home authorities the fullest possible information regarding the character and extent of our resources.

Financial Result of the Paris Exhibition.

THE footing up of accounts in connection with the Paris Exhibition indicates that if there be a deficit at all, it will be but a small one, while possibly there may prove to be a surplus—depending upon the willingness of the city to purchase certain improvements of a permanent character on the banks of the Seine. The cost of the buildings and other works was $18,000,000; the expenses of administration $1,700,000; policing, lighting, etc., $2,500,000; "unforseen expenses" nearly $10,000,000; miscellaneous expenses, $250,000, a total of $23,450,000. The receipts from all sources, including subscriptions of $4,000,000 each from the city of Paris and the Government of France amounted to $23,050,000, leaving a deficit of $400,000. This is a much better showing than was made by the French Exhibition of 1878, when the receipts fell short of the expenditure by six million dollars.

The School of Practical Science.

ATTENTION was called in these columns recently to the overcrowded condition of this school, and the urgent need for increased accommodation and equipment. During the present month this need has been forcibly pressed on the attention of the government by a petition presented by the students of the school. The prayer of this petition was strongly supported by deputations representing the Toronto Board of Trade, the Ontario Association of Architects, and the Canadian Manufacturers' Association. Emphasis was laid on the necessity of providing adequate educational facilities for the large number of young men who are desirous of qualifying themselves to fill the more lucrative positions in the rapidly developing industrial enterprises of this country, which positions are at present too frequently occupied by graduates of foreign scientific schools. As an illustration of the present overcrowded condition at the School of Science, the fact was mentioned that the present first year class in chemistry, numbering 120 students, had to be divided five times. The Premier admitted that means must be found to increase the ac-

commodation and efficiency of the school, and that at the present rate of expansion a new building would soon be the only remedy. The cost of a suitable building, together with the necessary additional equipment and teaching staff, was placed at about $300,000. The government would seriously consider what action should be taken and from what source the necessary funds could be obtained.

A Dominion Exhibition.

THE Dominion Government is said to have appropriated large sums of money to cover the cost of Canadian exhibits at the Glasgow and Pan-American Exhibitions. A large sum was spent for this object at Paris last year. We are not disposed to question the wisdom of these expenditures. It is good business policy to advertise to the world the character and extent of our capabilities and productions, thereby inducing increase of our population and investment of capital. Why should not this be supplemented by the holding of a Dominion Exhibition in Canada and the effort to induce foreigners to come and actually see for themselves the kind of country we have and the greatness of its resources? We cannot hope to carry out an exhibition on the scale of those held at Chicago and Paris, nor should the attempt be made. Our natural development has reached a stage, however, which should warrant us in entering on an undertaking of this character on a properly proportioned scale. The Dominion Government last year refused to assist such a project, perhaps because of the large expenditure that was felt necessary to secure adequate representation at the great international Exhibitions at Paris, Glasgow and Buffalo. Next year when these shall have passed out of sight the subject of a Dominion Exhibition should receive practical consideration, and the Federal and Provincial Governments which for many years have been spending money on Exhibitions got up by and largely for the benefit of other countries, should make a liberal appropriation towards a Canadian Exhibition to be held in Canada, which the mother country, our sister colonies and our neighbors across the line should be invited to visit and send exhibits to. We have the nucleus of such an Exhibition at Toronto, and in connection with the proposal to erect new buildings the larger project should be kept in mind. It is doubtful if the property owners of the city whose approval must be obtained will sanction the proposed large expenditure for new buildings until just cause of complaint with the management of the Exhibition shall be remedied. If the project of holding a Dominion Exhibition in the near future is to be proceeded with it would be desirable to defer action with regard to new buildings in order that a comprehensive scheme adapted to the larger requirements might be formulated.

Fire Escapes.

The injury and narrow escape from death experienced by employees of factories in Toronto recently owing to the absence of means of escape from burning buildings, has been the means of directing public attention to this important subject. It appears that the Factory Act, which stipulates that factories must be fitted with fire escapes, delegates to the government factory inspectors the duty of enforcing observance of this provision. The matter is thus taken out of the control of the city council. It is quite evident that the government inspectors have entirely failed in their duty in this regard. In consequence the lives of thousands of workmen and workwomen are daily in jeopardy. The subject has recently came up for discussion in the Legislature, and amendments are to be introduced which are designed to ensure efficiency, in the operation of the law. In a timely letter to the press Mr. A. J. H. Echardt has called attention to the necessity of providing the public school buildings with fire escapes. He instances schools of three and four stories without fire escapes and with only one stairway leading from the bottom to the top, which, in the event of fire starting in the basement, where the heating furnaces are placed, would act as a flue to carry the smoke and flames to the upper stories. The writer very correctly states that the ordinary iron five ladders attached to the outside of the school buildings would be of little or no use, but that the proper thing would be to have the back part of the school built out, or a separate tower built, with a stairway as wide as the main one, reaching right to the ground, with doors leading to this stairway from each flat, so that in case of a fire in the front stairway the pupils could be got out by the back way, so making a double exit, which the children could use with swiftness and safety. The school authorities seem to rely at present entirely upon the fire drill, which is a useful means of preventing panic in the event of fire and also under some circumstances of securing the safe exit of the children from the building. It would however be useless as a means of saving the lives of children on the second and third floors, should exit by the single stairway be blocked by smoke and flame. No time should be lost in providing a more adequate safeguard.

Methods of Heating in Relation to Health and Economy

THE paper presented by Dr. Bryce, Medical Health Officer for Ontario, at the recent annual convention of the Ontario Association of Architects, and which was printed in full in our February issue, contains much valuable information which architects and manufacturers of heating systems, as well as the public, would do well to study and carefully consider. The author of the paper lays special stress on the necessity for greater attention to ventilation in connection with heating. Further than this, he shows very clearly the necessity for a proper degree of moisture to be maintained in the air of living rooms. It is not only that there shonld be a proper supply of fresh air introduced, but what is quite as important, that this air should contain a proper percentage of moisture. Dr. Bryce stated that where this percentage of moisture is not supplied, the air takes up moisture from every available source, including the bodies of the inmates of the building. He pointed out that in a school-room, for instance, where the air was not sufficiently moist, part of the necessary moisture was obtained from the mucuous membrane of the children, thus leading to irritation of the membrane, and rendering the children very susceptible to disease. Here may possibly be found one source of the spread of diphtheria and other diseases of an infectious nature to which children are specially subject. Apart from this effect upon health, it appears that moisture in the air has also an important bearing upon economy in fuel. The author of the paper referred to stated that the inmates of a room, the air of which contained a sufficient amount of moisture, would be comfortably warm with the temperature at 60 degrees would the inmates of a room with dry air at a temperature of from 70 to 75 degrees. He estimated that to raise the temperature from 60 to 75 degrees would entail an additional expenditure for fuel of 25 per cent. These, and other statements, made a decided impression upon those who heard the paper read, and, in view of the importance of the subject, we have thought it advisable to call the special attention of our readers to it.

The Commercial Position of Great Britain.

FOLLOWING closely upon the announcement that Russia has increased its tariff on United States goods, comes a despatch from London that as an outcome of the inroads of American manufacturers upon British trade there is being formed the National Federation of Master Associations and Trades Unions to educate the minds of employees and employers in respect to the expansion of British trade, to devise means to meet foreign competition, to send joint deputations of capital and labor abroad to enquire into the conditions of other countries, and to provide a federation where employers and employees may meet on the same plane. This movement is under the leadership of Mr. John Lockie, late conservative member for Devonport, and is said to have the approval of the present British government.

The United States have not only become a strong competitor for the foreign trade of Great Britain and other European nations, but have also invaded the British market, and are securing a large share of the home trade. It is stated that in one industry alone (the manufacture of boots and shoes) Great Britain's trade last year was less by $5,000,000 than in the preceding year, notwithstanding that the firms engaged in this industry are said to be among the most progressive and enterprising in the way of adopting improved machinery and other manufacturing facilities. The American manufacturer takes infinite pains to adapt his goods to the requirements of the particular market in which he seeks to sell, and by liberal advertising and persistent push keeps their merits before the notice of prospective buyers. In Great Britain there are many long established businesses which have descended from father to son. This has in many instances induced the idea that the system of management and character of goods that have been successful for so long a period may safely be continued. Rapid and startling changes are, however, taking place throughout the world, bringing changes in methods and requirements of the people. The nation that studies most carefully these changes, and constantly adapts its products to the new conditions, is the one which will obtain and maintain commercial supremacy. In this regard the United States seem to stand foremost to-day among the great commercial nations of the earth, hence the strides they are making in the development of their foreign trade.

It is gratifying to note that Great Britain is awaking to the situation and considering ways and means whereby she may hold her commercial position. History has shown that the British people when once aroused are prompt to act for the protection of their interests whether territorial or commercial. Prompt, intelligent and thorough enquiry into the subject of Britain's commercial facilities and relations with other nations would seem to be a present and important necessity, and should be followed by equally prompt, intelligent and thorough reforms in methods, where such are found to be necessary.

The United States exports to Great Britain and Ireland are valued at $600,000,000 per year, while the value of the imports from Great Britain into the United States is but 25 per cent. of that amount. The United States exports to Canada for the fiscal year ending June 30th, 1900, were valued at $109,844,378, or more than the combined imports of France, Australasia, Austria-Hungary and Russia. While profiting so largely by British and Canadian trade, the United States continues to maintain a high tariff wall against these countries. The time seems to have arrived when freer access should be demanded by Great Britain and her colonies to the United States market, and in default of reciprocity of trade there should be a nearer approach than at present to reciprocity of tariffs.

Great Britain has in her colonies commercial allies which as yet she has scarcely taken any steps towards reaping the advantage of, but which, if brought into closer relations with her, would greatly assist in extending and maintaining her commercial supremacy. Canada has shown a desire to enter into such relationship by giving a substantial preference to British goods entering this market. That this action has not resulted in greater advantage to British manufacturers is largely due to the failure of the latter to make their goods better known in Canada, as well as to adapt the goods to our requirements.

Another phase of this question, as seen by an American writer, is presented in the following extract from the Engineering Magazine, of New York: "To the outside world the most impressive lesson of the Queen's death is the magnificent stability of British institutions and the British commercial system. Not a wheel stopped, save as a token of reverence; not a tremor in values disturbed financial centres; not an uneasiness or uncertainty as to national politics caused business undertakings to waver or hesitate. Compare this with the quadrennial upheaval in the United States, where economic legislation of every kind is the football of politics, and industry follows with uncertain feet now artificially raised on an unstable platform of protection, now sinking back from the morass of free silver, certain of nothing but uncertainty with every change of chief executive. The "demise of the Crown" demonstrates anew England's industrial strength, and those who are ready to cry her downfall before her industrial rivals would do well to remember that this stability of commercial organization outweighs much mechanical aptitude. Machinery can be bought, skilful brains and hands can be hired; but stable, political and commercial systems are of slow growth, and not soon attained."

A conference of Australian architects has been held for the purpose of forming a Federal Institute. In order to aid in the promotion of education it is intended to establish a travelling scholarship.

The Canadian Manufacturers' Association have requested the Mayor of Toronto to call a meeting of representatives of various organizations, such as the Board of Trade, the Trades and Labor Council, Ontario Association of Architects, the Guild of Civic Art, to prepare a plan for the beautifying of the city as a Victoria memorial.

REDUCING THE FIRE LOSS IN BUILDING.

By Edmund Burke.

To put the matter in a nut-shell, the best means of reducing the fire loss would be the conversion of the insurance companies to more scientific examination and classification of risks.

Rooms of the Ontario Association of Architects and Toronto Engineers' Club, 96 King Street West, Toronto.

It is useless to argue that strict civic by-laws should be enacted. The Ontario Association of Architects through the local organization in Toronto, made a serious effort in this direction three or four years since, when endeavoring to have the city by-laws revised and improved. They were immediately confronted with objections by real estate owners, aldermen and builders. These affirmed that the increased cost which would be involvedby the adoption of proper and scientific methods of fire resisting construction would put an effectual damper on building operations. The good intentions of the architects, as a consequence, came to naught. It maybe taken for granted that the only way to effectually reduce fire risk is to appeal to the pocket of the building owner by means of decidedly low rates of insurance on classes of buildings which absolutely conform to the best known methods of fire resisting construction.

Rooms of the Ontario Association of Architects and Toronto Engineers' Club, 96 King Street West, Toronto.

There is no doubt but that the total volme of insurance would be reduced were such methods adopted, while on the other hand the fire losses would be much less, and the net profit of the underwriters greater.

The same unity with regard to risks, as that now exercised in the imposition of rates, should result in immediate and great improvement in methods of construction.

It may be asserted that it devolves upon the architect to introduce better methods. The true architect, who has the safety and welfare of the community at heart, is only too glad to adopt the very best methods, but in ninety nine cases out of the hundred his hands are tied by his employer; he is told that it is folly to add twenty, thirty or forty per cent to the cost of a building when there is but little difference or advantage in rates of insurance. The desire of the building owner is to obtain the greatest return for least outlay, and he will naturally object to enter into any increased expenditure which will not bring corresponding returns. The lightly built cheap building of the usual fire trap construction, generally returns, for a time, the best net income, and he therefore prefers and insists upon the erection of that class of building.

It should be borne in mind that every fire resisting building is a boon to the community. It is an efficient fire stop, and reduces the fire risks for a considerable radius in the neighborhood. Every additional building of the kind is a further safeguard, and were such buildings sandwiched freely among those of even the most flimsy construction, no very extensive and wide spreading conflagration could occur.

Rooms of the Ontario Association of Architects and Toronto Engineer's Club, 96 King Street West, Toronto.

The greatest encouragement, therefore, should be given to those who are willing to erect buildings of the best class of fire resisting construction.

Fire hazards may be divided into two classes, external andinternal. With regard to external hazards, the fire loss in buildings would be very appreciably reduced were more attention paid to the protection of the window openings. The complete destruction of the inflammable interior fittings and stock of a large fireproofed departmental store in Pittsburgh, was chargeable to a fire in an adjoining building and unprotected window openings, as was also the burning out of a portion of the interior of the Home Life Insurance Co. in New York City. The latter building was considered one of the best of New York's fireproof buildings, but an external fire attacked it in a weak spot. If the windows in the light well overlooking an inflammable building close by had been properly protected no serious damage would have occurred. The standard wooden shutter covered with tin is the most reliable protection.

Woven wire glass set in metallic sashes, which are hung with chains in metal frames are superseding the wooden tin covered shutter in many instances.

The advantages are that the light is never shut out, they are not so liable to be left unclosed, or carelessly left open, as is the case with the shutters, and if a fire starts behind them it is not concealed till it has obtained great headway.

Where greater safety is desired the glass may be doubled, giving almost as good protection as the shutters; the tin covered shutters, however, are required for certain of the most severe risks.

Wire glass is, of course, practically out of the question on street frontages.

Rooms of the Ontario Association of Architects and Toronto Engineer's Club, 96 King Street West, Toronto.

Rolling metallic shutters are occasionally used, but the cost, and the time and trouble required to open and close makes their general use impracticable.

The water curtain is another device for the protection of external openings. It has been used in very few buildings, and it is a matter of surprise that owners

and underwriters are content to expose enormous stocks to the frail protection of sheet glass, or plate glass of large area which may be shattered on every storey in an instant, allowing the heated gases, if not the flames, of an adjacent fire to cause instantaneous ignition on several floors simultaneously.

The severity of our climate in winter presents a difficulty in the application of the water curtain. It is necessary to use what is called the dry system, the piping being kept free of water till it is required.

Among the other external appliances for reducing fire risks may be mentioned stand-pipes, which are carried up to the roofs of tall buildings, with attachments near the sidewalk for connection from steam fire engines or city pressure.

The provision for fighting an external fire from the roofs of the Eaton establishment undoubtedly saved those premises during the progress of the Simpson fire in Toronto in 1895. The internal hazards cover a large range.

Probably the greatest fire loss is occasioned through large undivided areas, not only horizontal but vertical. Until strict and undeviating rules are enforced reducing the area of all compartments containing inflammable material or goods, the fire loss will be abnormal. The structure itself may be built of the most approved fire resisting materials, but this will not save the contents. In fact there is danger that the burning of the contents, if great enough in volume, will wreck the building or so seriously damage it that extensive repairs or reconstruction will be involved.

It is equally necessary for the reduction of the fire loss that staircases and elevators should be entirely enclosed and cut off from the building by fireproof walls and automatic fireproof doors.

The height of buildings has a direct relation to the proportion of fire loss. It is practically impossible to control a serious fire with present appliances in a building of more than four storeys, or say 45 to 50 feet in height. Buildings of greater height should be built of fire resisting materials, divided into compartments of restricted area, and equipped with automatic sprinklers.

The partitions forming these compartments, to be thoroughly effective, should be constructed of brick walls stout enough to stand the hardest usage. The openings in these partitions should be protected with automatic fireproof doors, double for absolute safety.

Thin partitions of 4″ terra cotta blocks or concrete on expanded metal in fireproofed structures are sufficient under certain conditions, such as for the sub-divisions in office buildings and places where large accumulations of inflammable material are not permitted. These partitions, as usually constructed, are often a delusion. They have wooden door posts, heads and transoms and sometimes wooden sill pieces which may burn out and wreck the partition. Frequently all the hall partitions in an office building have large openings in the upper third or fourth of their height, filled with ordinary glass which offers no obstacle to the spread of fire between the rooms and halls. To be effective the glazing should be of wire glass in metallic frames, and the framing and doors of metal or protected wood.

The abolition of hollow floors and partitions would greatly reduce the fire loss, as all concealed spaces become flues for the rapid carrying of fire and smoke from one part of a building to another.

The strapping of floors and ceilings for the removal of the foul air from buildings heated by certain descriptions of hot air apparatus has furnished one of the most glaring examples of hazardous construction which it is possible to conceive. The whole building, under this method, is honeycombed with a network of concealed and continuous spaces, and but a spark is needed to reverse the current and carry the fire, almost instantaneously, to every section of the structure. Happily this system of ventilation is becoming obsolete, and none too soon as far as safety from destruction by fire is concerned.

The abolition of hollow construction and the adoption of solid floors and partitions is entirely feasible in all but exceptional cases, and even in these certain precautions in the way of fire stops could be introduced.

All external wood bracketting, cornices and other exposed woodwork, especially at considerable height, should be abolished; as good an effect can be obtained with metallic mouldings secured to wrot. iron bracketting or frame work.

In the so-called fireproof buildings too little attention is paid to the protection of the girders and columns. The floors are usually of a most solid description, but the parts referred to, which receive the first and greatest impact of heat have frequently but a thin veneer of fire resisting material which breaks or scales off permitting the heated gases to warp and twist the structural members, to the destruction or distortion of the building.

The fire loss could be reduced by constructing each floor as a watertight unit. The damage to the contents of lower floors by water only must constitute a large proportion of the fire loss.

It must not be forgotten that the inflammable wood trim and the contents of the best fireproof building ever constructed will burn if ignited. Few fires would spread if the first pail of water could be applied at the opportune moment.

One of the very best means of reducing the fire loss is the automatic and early application of water. This is accomplished by the installation of automatic sprinklers. Every foot of the premises to be protected should be covered making the spread of fire almost impossible under any but the most extraordinary circumstances.

Another important method of reducing the fire loss would be closer inspection of alterations. Frequently an otherwise safe risk is made a very bad one through structural changes in after years, sometimes made by or for tenants or others unacquainted with or careless of the original scheme adopted to make the hazard a safe one.

To sum up, "the best means of reducing the fire loss" lies largely with the fire underwriters who should encourage the best class of fire resisting buildings by adopting specially low rates for such, with penalties or increases for every infraction of well defined rules in connection with standard methods of construction and equipment.

The standard building carrying the most favorable rates should be absolutely fireproofed in every particular. The walls should be of brick or terra cotta, the columns; girders, and beams should be amply protected with terra cotta of good thickness, having air spaces, and so secured that displacement will be impossible. Little or or no wood should be used for floors and trim.

The building should have no large unbroken areas; brick or terra cotta partitions should divide it into sections of moderate size. Stairs and elevators should be completely cut off from the rest of the building with fireproof enclosures and doors. Floors should not be pierced with well holes. Exterior openings on areas, lanes, etc., should be protected with wire glass in metallic sashes or with tin-covered shutters, and those on street frontages with rolling metallic shutters or water curtains. Stand-pipes should be run from sidewalk to roof. A sprinkler equipment should be installed, and each floor should be made a water-tight unit. If the building is of such a height that the city service will not protect the upper storeys a special pumping plant should be installed with stand pipes and hose on every floor and on the roof.

An ascending scale of rates from a very low minimum rate should be adopted, placing adequate penalties or fines in proportion to the departure from the standard of safe building.

High buildings not fireproofed or protected by sprinklers and shutters should be discriminated against by extra high rates.

Buildings having beams and joists of wood should have open construction, avoiding closed spaces. The joists should be heavy and set a good distance apart, carrying heavy plank floors. All spaces caused by furring out or strapping should have frequent cut-offs or fire stops. The areas should be divided as in fire resisting buildings, but with even greater care and of less size. Elevators and stairs should also be similarly cut off.

STUDENTS' DEPARTMENT.

TORONTO ARCHITECTURAL EIGHTEEN CLUB.

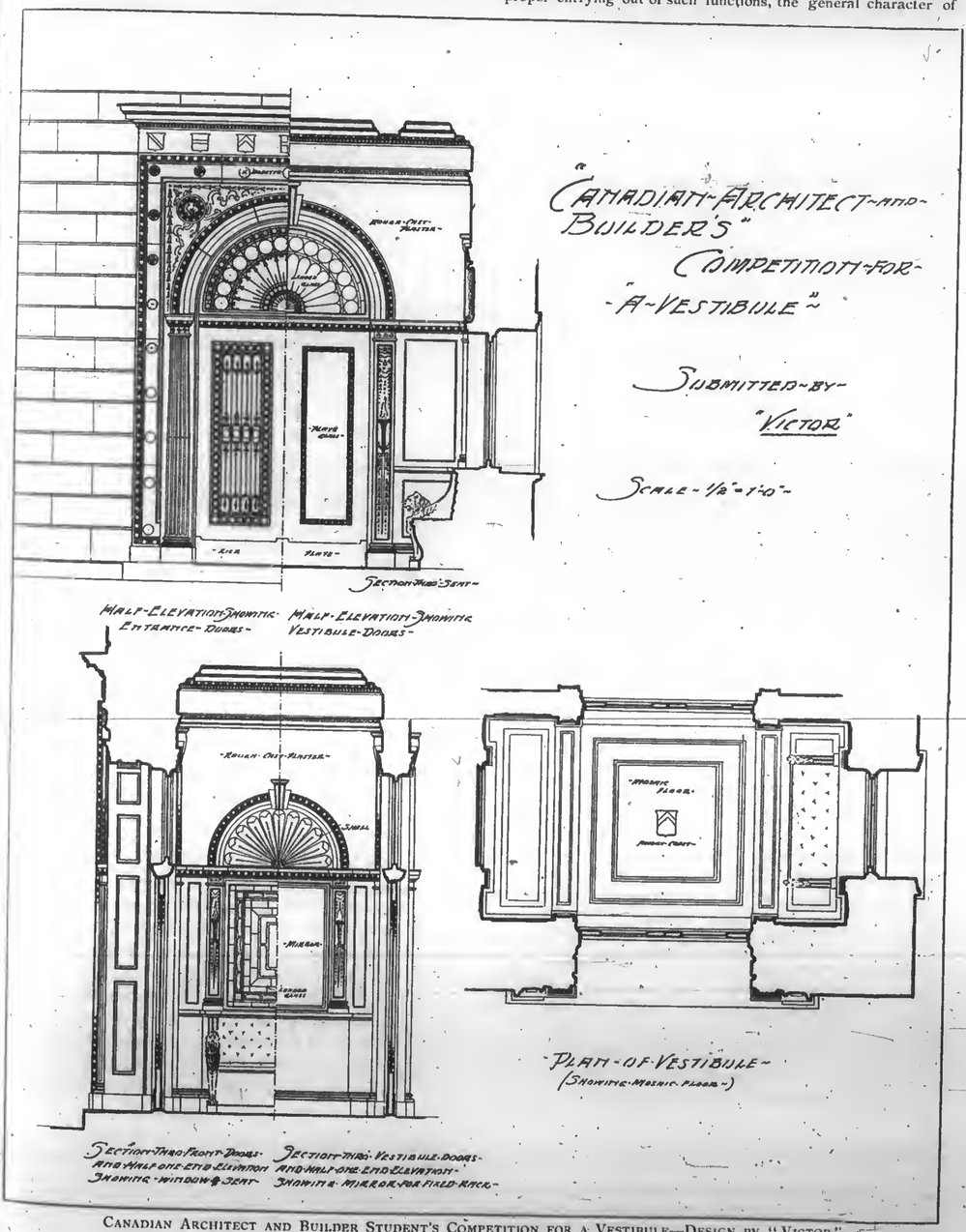
The Club have affiliated with the Central Ontario School of Art and Design, of which they will form the architectural section. Rooms have been secured in which to carry on the educational work in behall of students. This work is under the direction of an Executive Committee of three. The Committee have appointed six patrons who will act as instructors to the classes, of which three have been formed—one primary and two advanced.

Three meetings have already been held with an average attendance of about fifteen students. The rooms are at the disposal of students for study at all times. Criticisms of the students's work will be given by the instructors on Tuesdays and Thursdays.

The following is a programme of the first problem in design:

"A Casino on a wealthy gentleman's wooded estate. The building is to be constructed of stone or marble.

"The casino is to be used chiefly in summer time and will be a building of a monumental character. Concerts, dances, etc., will be held there, and accommodation must be provided for the proper carrying out of such functions, the general character of



CANADIAN ARCHITECT AND BUILDER STUDENT'S COMPETITION FOR A VESTIBULE—DESIGN BY "VICTOR" (MR. WILLFORD A. GAGNON, MONTREAL), AWARDED FIRST PLACE.

such a summer casino should be well considered in the plan.

"A stream runs through the estate, and a building may be placed so as to take advantage of this in the general scheme of surroundings or not, as the designers see fit. The levels of the grounds are left to the imagination. It is specially desired that this building should have a classic treatment.

"Each student will make a study of his general scheme in plan and elevation of a scale to 1/16 in. to the foot and send a freehand tracing of the same, dated and signed, to the Chairman of the Educational Committee, on or before noon Wednesday, March 6th, 1901.

"As this programme is issued for the purpose of classifying the students, the preliminary sketch will determine who shall proceed with the development of the problem. Those who are not found eligible will be placed in Class "C" or Preparation Class. Those who finish the problem and render, will be placed in Classes "A" and "B" according to the mentions they receive. The drawings sent in finally must conform to the general outline and scheme shown on sketch first submitted. Any radical departure therefrom will debar the student from being given a mention, but not from general criticism. Final drawings to have the plan rendered showing the general arrangement of the immediate surroundings at a scale of ⅛ in. to the foot, the section at the same scale and the elevation at a scale of ¼ in. to the foot, also a drawing of detail at a scale of 3 in. to the foot. The drawings to be rendered in wash with cast shadows. Drawings to be delivered on a date hereafter determined."

The Executive Committee state that arrangements are being made to give instruction in scientific subjects next autumn.

A TWENTIETH-CENTURY ARCHITECT.

By Banister F. Fletcher.

And if this is a correct view of the architecture of the coming century, what of the architects—of the creators of such work? If architecture in its outward forms has not advanced by any revolutionary stages along the highway of progress, yet in the manner of construction she has and will develop exceedingly. Old Philbert de L'Orme, an architect of the French Renaissance, once said that an architect should have four eyes, four ears, and three hands, and if it was necessary then, what now? An architect nowadays is necessarily skilled in mechanics, several sciences, and in various arts connected with architecture. Now architecture differs in one essential quality: that while the latter is a matter of commonsence, which everyone understands, and therefore can appreciate, the former in its highest stages is based on appreciation of æsthetic quality, which the public can scarcely be expected to understand. The new century will be a utilitarian and scientific age essentially, and architects will have to adapt themselves more to the requirements of the time, and hold less to the antiquated ideals of the past centuries, if they are to capture and retain the public interest. We must be of the 20th century if we would succeed in it. Therein lies our great difficulty, prevalent in no other profession, for architecture is an art, science, and profession. In architecture we have the artistic requirements sadly hampered by the material needs, and above, dominating those, the professional qualifications requiring us, as men of business above all things, to protect our clients' interests. The question of architectural education, therefore, is an important one. The foundation of the Royal Institute of British Architects and the Architectural Association in this century, and the institution of professional examinations are merely the reflection of the spirit of the age, in which the public require to have some indication that the men they employ are capable, and, in fact, that they are qualified to practice their profession. This will undoubtedly lead to a compulsory registration for architects, when no one will be allowed to practice without a diploma. To the public it is a never-ending theme of amazement that anybody can call himself an architect. And truly it is quaint. We cause the men we direct on our buildings to be registered. We have our registered plumbers, our carpenters, bricklayers, joiners, plasterers, and masons, who have all served their apprenticeship, besides being technically educated, and yet anybody can call himself and practice as an architect. Let us think for a moment of the power for good or evil in an architect's hands, due to his knowledge or ignorance in matters connected with building, and then who can doubt but that this compulsory registration is bound to come? Opposition has always been forthcoming in these matters. In the law, in surgery, and in medicine, the same well-worn statements have been flung back to those who have advocated progress, and generally this opposition comes from the older men, the relics of a past age, who can see no good in change of any kind. The only real difficulty is the question of the possibility of examining in art, and, as far as the public goes, it would not matter if art were left out of the question, for in nine cases out of ten the public employ us to protect their interests, and not to provide them with artistic work, about which they know little and care less. The principal thing to remember is that the public expect us to be thoroughly qualified all round, to be directors and experts of all departments of building, and to possess the business qualifications for guarding their interests, which are usually associated with the profession of the law. If a profession or calling which is employed by the public is to continue to exist there must be confidence by the public; and how are the public to know with certainty the qualified from the unqualified, unless some official qualification is available? Again, a great part of the architect's ordinary practice consists in utilitarian work, which requires no artistic talent, but which does require great scientific and practical knowledge and business habits. We have elsewhere hinted that sanitation will be the guiding star of the next century, and in matters of drainage, and in everything connected with the hygiene of the house with which architects are concerned, and they will, no doubt, be properly registered to deal with such work. If persisted in, the present fine-art theory of architecture, held by a few eminent architects who have clients enough to support their fancy, will tend to the gradual absorption of legitimate architectural work by builders or big firms of decorators, who probably will employ a "tame" designer to put a frontal to their stock plans. In regard to the increasing complexity of our civilization, the number, extent, and intricacy of new types of constructions, it may also be expected that the tendency to specialize will develop itself, although the general practitioner will, of course, continue to hold his place, as in other learned professions. Such are a few of the thoughts which I have been able to put together, dealing with the future of architecture, and although they are far short of what I had hoped to produce, yet, in the time at my disposal, I have found it impossible to go more deeply into the subject, but hope that I may, at least, have made suggestions upon which a discussion may be profitable.

* From a paper read before the Birmingham Architectural Association, on Architecture of the Twentieth Century.

Draughtsmanship, says the London Building News, has been put before design or thought to a degree that has discouraged the practical and artistic minds in the profession: and we do not mean by this word skilful drawing or sketching, but the business of making and coloring perspective and other drawings of buildings by men who know little or nothing of construction.

THE SUMMER COTTAGE AND ITS FURNISHINGS.

Paper read by G. A. Reid, R.C.A., before the Ontario Association of Architects.

The question of the summer cottage may appear at first glance but a trivial one, one which might be set aside as a simple temporary shelter that the architect need not give more than passing consideration to. However, as we examine the matter it grows in import, and we find it is only a part of that group of problems the solution of which we hope will make possible a new life and nobler arts.

There can be no right consideration of any art which does not link its extremes together, which does not realize the dependence of the greater upon the lesser, and, while this is a truism in both art and life, the exigencies of our modern life have driven us to great extremes in our mode of living, producing conditions which huddle us too closely together in the cities, and separate us too much in the country, both of which are unnatural. Even the nomad races are social, carrying with them manners and customs which correspond to those of the races with fixed abodes. We are all idealists when it comes to building our homes, and whatever state of development we may be in we seek to beautify them even if they are barely habitable.

The summer cottage in the present state of the development of this new country can scarcely be considered by architects to be a practical issue in architecture.

The work of the architect under the conditions which obtain must of necessity be confined to narrow areas. His work will not pay unless he can go quickly from one building to another in the work of superintendence, and in these days of the books of 100 designs with estimates for $1.00 it is useless to consider the making of the design only. Moreover, no architect, I venture to say, but will agree that the right kind of work must be done largely in personal superintendence.

However, there are influences of an artistic sort working among us, which I believe will in time bring the minor erections more within the architects' field of activity. Perhaps even the stock design period which we have been in for some time may only be one of the indications of improvement.

Residence of Mr. G. A. Reid, R.C.A., Indian Road, Toronto.—Designed by Mr. Reid.

There are also influences of a material sort which I believe will combine to extend the influence and scope of the architect.

The main influence of the artistic sort may be said to be the development of the finer senses of the masses of the people through education and the consequent desire to surround the civil and domestic life with forms of art.

Those of the material sort are perhaps dependent on prosperity, for with assured stability both individual and general, more and more advantage may be taken of facilities for education through study and travel. The natural desire of every one is to have his own home, and if the forethought of the wise economist is added he considers the value in renting or selling in case of emergency. The great possibilities of new inventions and discoveries must also be counted upon to revolutionize our present conditions.

It seems, then, that it is just possible that the summer cottage may be a misnomer in the days to come, and that with new discoveries and inventions, and with rapid transit, the suburban home may become the country house, and the extremes to which we now swing in going into the wilds of nature for a period and living as artificial savages may no longer be felt necessary.

In any case though these speculations may be quite outside the realm of the practical at present, are not the possibilities very great, and quite well worth while contemplating?

Is it not a likely thing to see in the future with better conditions surrounding us, the architect designing with equal care the small and the large erection (I mean in respect to its qualities of fitness and appropriateness), and if competition were less strenuous, and the love of art and emulation were more, the impulses of the architect we can easily see that with the talent now here great things would result.

But in the matter of competition, without any change in the principle, I can see how the results may work out differently from what they do at present. As it is now, competition is short-sighted, and for the sake of getting a piece of work passed the contractor will resort to many devices and deceits, and to keep his job the workman will scamp, while the temptations to the architect are myriad. Human life is short and we are forgetful and forgiving, and while the friendly compact is a strong bond, and the wielding of the vote and influence has many aspects, when the day comes when the claims of art strike deep into the heart the judgment will be more inflexible, for who has known the true artist to be a man to use what is termed the "pull."

I say then that I can see how the character of competition may change, how the workman who is too true to his work will refuse to slight it after he knows what kind of work he is expected to do; how the contractor will find that the memory of the enlightened architect is long; how the architect can be more loyal to his art than to an ignorant client, and how the client himself may realize that his architect has an art to be true to, the contractor a duty and a name, and the workman a craft in which he can delight.

If at the same time social conditions were such that ostentation would be a breach of common good manners and honest ability was prized at its fullest worth the new art and architecture might be expected to appear.

In the meantime, which is certainly while we live, we will have to work along with very poor makeshifts in the arts. We will have to endure jealousies, imitations, falsities, and a lack of unity everywhere. And the first principle of art to put the right thing in the right place we are to see continually violated, and perhaps ourselves to become the victims of circumstance, for in that atmosphere there is a tendency to grow callous, and as we grow older our youthful ideas grow weaker one by one.

However, I would never admit that an artist or architect should be excused for getting so hardened in the use of makeshifts that he would cease to distinguish between that which was appropriate, and that which was inappropriate. Though there may be differences of opinion in details of the fit and the appropriate, there is unanimity in all the logical minded on general principles.

If we see a roof or a wall which suggests complete protection from rain and wind we derive a satisfaction, but our faculties are such that the first requirement when once satisfied demands the satisfaction of another and another, and never leaves off making demands. It is thus that the arts grow.

Growth in art, however, should not be mere addition of items but should in fact be the opposite, the refinement of parts and the elimination of the unnecessary. Thus the purest form of art may be a tendency towards economy. Certainly it is opposed to ostentation and pretence.

The union of the arts, which I believe ought to exist, can only be brought about, perhaps, when there is greater uniformity of education and general culture. This will serve to wipe out some of the causes of suspicion and jealousy which is the great obstacle to the broad development of the arts at present.

In a conversation which I had with an architect not long ago on the subject of mural decoration, while agreeing to the principle that walls should be decorated he said that architects could hardly be blamed for being jealous of mural decoration, as a picture placed on the wall of a building brought its author ten times more credit in proportion to the effort expended than that which went to the architect.

This, I believe, is about true, and it certainly is a deplorable thing that it is so, showing as it does the unbalanced state of true culture among us. Some phases of art are much exaggerated as to their true value, while other phases are wholly neglected. Some so-called art connoisseurs who fondly imagine that they are appreciating art are often merely valueing it in its aspect of the fashionable, curious or scarce. A picture or object may be al-

these and yet very poor art, but the point is that right appreciation should seek to intelligently discover merit in every form of art, and when not admiring it at least to respect it. This, however, can only be found when there is wide culture and consequent universality of thought.

Lack of unity in the arts and breadth of culture and appreciation brings in a whole train of anomalies in architecture as in all the arts.

In conclusion I wish to say that as an artist if I had no word to leave with you as a message I would not care to appear before you. I deem it an honor that I should be asked to address you and I hope I have made it appear so to you. But I prefer to consider that it it is an honor to the arts we represent that there should be an acknowledgement of interpendence, and while my effort has been to treat of a minor phase of architecture I regard the subject as a wide one involving the growth of the idea of the beautiful in the whole community, and the expression of it everywhere, from the simplest cottage in all its aspects of shape and setting, its furnishing and decoration, to the monumental building where we seek to stimulate ourselves to doing noble deeds by commemorating those that others have performed, and by holding up ideals of action and aspiration of beauty in form and color.

And whether we esteem architecture as the mother of all the arts from which she cannot be separated, or regard it not as an art but as that unifying principle which binds together the greater and the lesser arts it is all one in the interest of true art, the love of which should make for unity of purpose all the efforts of its votaries.

SYNOPSIS OF REMARKS ACCOMPANYING VIEWS SHOWN BY MR. REID PREVIOUS TO READING HIS PAPER.

Mr. Reid apologized that he should appear before the Association to show them some work of his own in the architectural line, but as the invitation to read a paper was accompanied with the suggestion that the subject should be "Summer Cottages," and as some of his architect friends in Toronto had come to know that his summer work was mostly given to the building of cottages at Onteora in the Catskill Mountains, he felt that it was only fair that he should show some of this work and give them the benefit of his experience. He said that there was, however, a difficulty to face in that it was hard not to make it appear a parade of his small efforts, and he would have found it much easier to talk on a subject which had to do with his own profession of painting more directly.

Mr. Reid then told of how in his boyhood he had been apprenticed to an architect and had some practical experience in building and that when he came to build his cottage at Onteora he set about to design and build it himself, and that the character of the cottage was admired by a settler in the colony who insisted, in spite of protests, that Mr. Reid should build a cottage for him on the same general lines. Several views of this cottage were put on the screen along with Mr. Reid's own cottage showing their points of similarity and difference. The essential points of the construction of various parts were shown, their adapation to site, etc., explained, and finally Mr. Reid said that though he had received compliments and admiration for this house from many known people, some of them noted New York architects, he felt more satisfaction in the fact that he had been commissioned to paint a decoration round the upper part of the high living room, for however much he liked to build he preferred to paint still more.

A number of views of cottages were thrown on the screen among them were some of the cottages built last summer for Miss Maude Adams, the actress, who made such a success of the role of Babbie in the "Little Minister," and also the little stone church, an interior view of which showed Mr. Reid's decoration of adoring angels.

In an apologetic way Mr. Reid said he had to confess to about twenty erections, numerous alterations, and over 100 pieces of furniture, some of the latter being shown in the photographs. A general description of the colony was given, the artistic and literary pursuits of its inhabitants, etc., and some general views were shown. The last slide shown on the screen was a view of Mr. Reid's house just built in Toronto from his own designs, and which he remarked had helped to get him into the dilemma of having to show his amateur performances to architects.

A prize of $500, to be annually awarded irrespective of age or sex to the best picture by an American artist residing in the United States, has been established at the Society of American Artists by Mr. Andrew Carnegie.

PERSONAL.

Messrs. Eden Smith and J. P. Hynes, architects, have removed from the Canada Life Building to new and more commodious offices at No. 32 Adelaide Street East, Toronto.

Mr. C. H. Rust, City Engineer of Toronto, has recently returned from Europe, where he spent some time in studying methods of sewage disposal and other problems in municipal engineering.

Mr.F. S. Baker, F.R.I.B.A., of Toronto, was recently bereaved of his father, who was drowned by falling into an open well at Utterson, Muskoka. The late Mr. Baker, who was 72 years of age, was a well-known and much respected lumberman.

Mr. Acilde Chausee, Architect and City Building Inspector of Montreal, has received notification of his admission on Jan. 10th as a corresponding member of the Societe Central des Architectes Francais. The notification was accompanied by a diploma in bronze of artistic design.

A grateful tribute to one who did much to beautify American cities has been paid to his memory by the Park Commission of Boston. It has joined Leverett and Jamaica parks and given the name of Olmsted Park to the entire area. Frederick Law Olmsted put the stamp of his genius on most of the notable parks of the country, and it is gratifying to learn that his name will hereafter be associated with a work of this sort.—Engineering Record.

Prof. Loudon, President of Toronto University, and Mr. C. H. C. Wright, Lecturer in Architecture at the School of Practical Science were recently tendered a complimentary dinner by the Madawaska Club. This organization, of which Messrs. Louden and Wright have been active members, is composed of the faculty and graduates of the university. The club have a summer rendezvous on the Madawaska River, in the Georgian Bay district.

Mr. H. C. Symmes, a well-known engineer and contractor died at his home at Drummondville, Ont., on the 9th inst., of congestion of the lungs. Mr. Symmes was a graduate of Harvard University. In his early days he was connected with the engineering staff of the Great Western Railway. Subsequently he became senior member of the firm of Symmes & Mitchell, and carried out many important contracts in connection with the construction of the Welland and St. Lawrence Canals, Toronto Water Works, the Cantilever Bridge at Niagara Falls, the Chignecto Ship Railway, etc.

THE NEW TORONTO HOTEL.

THE new Toronto hotel, an illustration of which appears in this issue, will cover an area of 164 x 197 feet, and will be six storeys high. It will be constructed of brick and stone with terra-cotta trimmings, and will be made absolutely fireproof. The main hall will be finished in marble and oak, the entrance in Cuban mahogany and marble, the cafe in oak and marble, the restaurant in ivory and gold, and the Rathskeller in oak and marble. The bedrooms will have cement floors.

AN IMPORTANT COMPETITION.

THE West Australian Government is inviting competitive designs for new Houses of Parliament, to cost $100,000. Three premiums are offered, viz., £500, £200 and £100 for the first, second and third designs. The designs are to be delivered on April 16th, 1901, and the competition is to be open to all.

The name of the Hamilton Art School has been changed to "The Hamilton School of Art, Design and Technology."

An Ottawa despatch states that the statue of the Queen ordered by the Dominion Government some time ago will be placed in position on the main walk to the Parliament buildings in front of the main entrance. The monument of Hon. Alexander Mackenzie will be placed on the lawn near the library.

The Society of Engineering and Applied Science was recently organized at London, Ont. The following are the officers elect: President, Prof. Bowman; vice-president, F. W. Merchant, M.A.; secretary, F. W. Farncombe, C. E.; treasurer, R. Kirkpatrick; Organization committee, Messrs. Merchant, Hunt, Mitchell, Leonard, Bowman, Henry, Sifton, Campbell, and A. W. Whyte.

The Ontario Society of Artists have elected the following officers: Hon. Pres., Hon. G. W. Allan; Pres., G. A. Reid; Vice-Pres. and Treas., C. M. Manly; Sec'y, R. F. Gagen; Executive Council, Messrs. F. M. Knowles, F. S. Challener, Laura Muntz, J. W. L. Forster, G. Hahn, W. D. Blatchly, and F. M. Bell-Smith; Industrial Exhibition representatives, F. McG. Knowles and E. Wyly Grier.

BY THE WAY.

THE Toronto Athletic Club building recently purchased by the city council of Toronto has been remodelled under the direction of Mr. A. F. Wickson to meet the requirements of the Toronto Technical School. On the first floor are the classes in modelling, architectural drawing and building construction, industrial art and freehand drawing.

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SEVERAL informal luncheons have lately been held by the architects and engineers of Toronto in the new rooms which have been fitted up for the use of these bodies at No. 94 King Street West. The popularity of the idea is attested by the good attendance. The majority of professional and business men lunch down town, and there is every reason why they should once a month or oftener meet in this way, enjoy a social chat and better their acquaintance.

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A GENTLEMAN who had an office in the Board of Trade Building, Montreal, writes that when the vault was opened after the fire which destroyed the building, the books and papers which he had placed therein for safe-keeping, were found to have been reduced to dust. The subject of vault construction is one to which greater attention should be given. Unless a vault be constructed in such a way as to be absolutely proof against fire, it is worse than useless, as persons are likely to entrust to its false security their confidence and valuables.

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THE announcement that it is the intention of the American Institute of architects to hold its next convention in Buffalo during the Pan-American Exhibition, leads me to suggest that the Ontario Association of Architects and the Toronto Architectural Eighteen Club might organize an excursion to the Exhibition which should prove a pleasant and profitable outing. It may be regarded as a foregone conclusion that with such an attractive and instructive display of architecture so near at hand every architect in western Ontario will determine to visit Buffalo next summer. Why then, should they not decide to go as body and thus be able to compare notes?

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THE tower of Bond Street Congregational Church, Toronto, has recently been an object of curiosity to architects and the public. The tower is built of grey stone which has grown dark and soft in color under the influence of the weather. At the south west corner is a pinnacle supporting a metal finial. Until recently this pinnacle corresponded in color with, and was generally supposed to be constructed of the same stone as the tower. The enterprising painter who recently "touched up" the wood work on the exterior of the church painted the pinnacle a glaring yellow, thereby proclaiming it to be of wood, and giving it the appearance of something which does not belong to the tower, but has been by accident "stuck on."

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I AM sorry to notice the manner in which the subject of a memorial to our late Queen is being dealt with in Toronto. Instead of uniting upon a well considered scheme, the citizens are being asked to support this, that and the other proposal. One of the latest suggestions is that a grand concert organ be purchased by subscription for the Massey Music Hall. The musical organization of which the author of the suggestion is the conductor forthwith committed itself to the scheme, by voting $500. If when the matter comes to be properly considered by all classes of the citizens, some other form of memorial should be decided upon, the organization referred to will probably withdraw its subscription. The citizens should hold themselves perfectly free until the subject has received proper discussion and consideration. Then let individual opinions and preferences be put aside in favor of what in the judgment of the majority should be done. If effort and money are wasted in half a dozen directions, nothing worthy of the occasion will be accomplished.

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THE Architectural Review, of Boston contains the following kindly reference to this Journal: The CANADIAN ARCHITECT AND BUILDER appears in a new and vastly improved form. The plates are better from a technical standpoint and the subjects illustrated are also of a higher order. In his review of the work of the century, the editor has analayzed admirably the events that have occurred, and his forecast of the possible future is no less intelligent. He declares that American architecture at present is French, very French, and few would be disposed to disagree with him. On the other hand, we are afraid still fewer would admit that he was right when he says: "It is a great question whether the real American architecture is not quietly developing elsewhere under the hands of Mr. Wilson Eyre and others. The Philadelphia school seems to have elements of true greatness in it". To be sure it seems to us that in this he is absolutely correct, but we were hardly disposed to believe until we saw the fact noted in a Canadian magazine that the admirable work of those who refuse to bend the knee to the dicta of the graduates of the French School of Fine Arts had impressed itself sufficiently upon the public mind to make possible a general recognition of its qualities. This testimony from an "extra territorial" source is profoundly gratifying. We reproduce one of the illustrations from this number. A view of the rear portion of the "Bible Training School," Toronto, by Messrs. Burke & Horwood, to our minds a much better piece of architectural design than the more ambitious front.

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REFERRING to the steadily growing fire loss in cities and the claim of the insurance companies that they are unable to realize profits at existing rates, the American Architect says: "The high department stores which give our conscientious building inspectors so much anxiety might be transformed in a week if the underwriters themselves would have the resolution to make the premium rates on them proportionate to the risk; but the temptation of a large line of insurance is too much for them to resist, and by keeping down rates on dangerous accumulations of goods, trusting to be able to make up their losses at the expense of the smaller and safer risks, they encourage the methods of building which they rail at architects for not suppressing. If the underwriters really wish to "reduce the fire-waste" in our cities the way to accomplish that end is to second heartily the building inspectors in their efforts to have the undivided space in mercantile buildings restricted by law within prudent limits; to use their influence for the repeal of the customs duties on structural iron, and to urge, in the several States, the passage of laws restoring neighborhood liability in case of fire. When these three objects are accomplished, it will not be long before great fire losses are quite as rare in our cities as they are in Paris or Vienna, and the underwriters, who alone have the influence necessary for bringing them about, will be prosperous and happy again, at the same time that they will have conferred upon their fellow-citizens an inestimable benefit."

PORCH OF CANADA COMPANY'S BUILDING, KING STREET EAST, TORONTO—(THE OLDEST BRICK BUILDING IN TORONTO)—NOW IN PROCESS OF DEMOLITION.

EXAMINATIONS FOR ARCHITECTS.*

By W. Cooper.

The training of an architect's pupil, if carried out in the orthodox style, is somewhat as follows, varying slightly according to circumstances :

On entering the office he practises office routine, such as copying specifications, quantities, and builder's accounts, tracing or copying drawings made by the draughtmen of the office, and in spare time copying examples of well-known works, measuring up old buildings, studying building construction (and sometimes geometry and other perspective) reading the history of architecture, and endeavouring to learn dates relating to the same ; occasionally he will attend art classes and science lectures in connection with the School of Science and Art in the provinces, or if in London, he will attend King's College, the Architectural Association classes, or other technical classes, and various private preparation classes.

Thus, if the student wishes to excel in the examinations instituted all over the world for the advance of his art, he must work diligently upon the works of other men, both in buildings and in writings, leaving no time for improving himself in any original ideas that he may be possessed of. He is induced to enter a competition for a scholarship or for a building ; and how well he knows that if he does not adopt the particular style in fashion, he stands no chance of success. For instance, what assessor will now look at Gothic work ?

It is needless to say that such a process of education stamps out for all time any chance of the student working in an original way ; because usually his time for working out original problems has passed when he commences working in earnest professionally ; yet this is the course of study which must be adopted if a man wishes to pass an examination to qualify as a member of any society of architects of standing. It is essential that an architect should have an artistic mind ; he should also be a constructor, he should be trained in business matters, he should have a very thorough practical knowledge of materials and their uses, and be up to date in sanitary matters.

In design absolute freedom should be allowed to the candidates. Style should be ignored, and many marks awarded for good proportion and consistent originality ; this would save some very precious time in preparation, and anxious and worrying months comparing differences of style, periods of architecture, and details of ornament relating to the same ; it would also induce a freedom not yet attained by latter-day architects. Study of former examples is well in its way; but it should be confined to the archæologist. Why go back ? If progress is required the motto must be "Forward."

Some will say, "Who is to judge the artistic merits of the design, or the good proportion of the features composing it?" The reply to this is, "Who shall judge the value of a picture?" or any other work of art, such as the grouping and finishing of a design in sculpture.

Very few marks should be given for draughtsmanship. It is a great tax upon some art men to make finished geometrical drawings, and this has the effect of cramping the hand and injuring the eye for drawing freely. A good knowledge of freehand drawing, shading, and perspective is imperative ; sufficient value is not given to these subjects, although they are all important to the art-architect.

Unfortunately the gift of art and science is not usually very fully developed in one brain ; consequently our most artistic men are bad constructors, and good constructors are invariably bad designers. Time can well be saved by requiring only a knowledge of the books in which to find formulæ for calculating strains and stresses, and other things (which are now required to be committed to memory), and how to work them out. The candidate should therefore be allowed to have the books of reference, such as architects have in their offices, but the questions should be such that the test of the study of the books is very thorough, so far as the means of finding out matter necessary to correct construction is concerned.

The anatomy of the building must be known, for as the sculptor and painter is better qualified by knowledge of the anatomy of the subject he carves or paints, so an architect must be more proficient the more he knows of the general principles of construction. The examinations in this should be very searching. Usually there is too much theory and not enough practical knowledge required of the candidate. Foundations, and how to deal with any foundations upon which a structure is to be built, should be one of the compulsory questions.

In this paper the candidate should show a knowledge of the names and addresses of well-known experts and testers of all classes of building materials, how all kinds of building materials are employed, and the reason why they are used for particular purposes ; he should also know the colour and distinguishing features of the various stones and woods. Some rough-and-ready pratical tests of the materials, such as bricks, stone, cements, lime, timber, and artificial preparations should be required, but most important of all, a thorough acquaintance, by sight, with the actual materials, samples of which should be in the examination-room. To the artistic mind, committing matter to memory is usually tedious and aggravating to a degree, but to remember by sight is comparatively easy.

The Contract.—A copy of this should be placed before the candidate and it should be required of him to explain any portions of it. What is the use of committing it to memory, as is required by most examining bodies ?

Prices.—A schedule of prices should be given, upon which to base the estimate of works or of the contractor's bill of extras. Values vary so frequently, and rise and fall so rapidly, they also vary in different centres so much that it is impossible to have a thorough knowledge of them at any time.

Quantities.—A certain knowledge of quantities is necessary, both in the method of taking them off, abstracting and billing, but few marks should be given for this, because an architect is not necessarily a quantity surveyor, but it is required of an architect to be able to check measurements and to measure his own work.

Land Surveying and Levelling.—This is wanted in a limited degree, and no examination is complete without questions upon it, because every architect who has to live by his profession, with a small practice, has problems in land measuring, and it is necessary to his success that he should know how to do it, at any rate until he can afford to keep or employ a land surveyor to set out the plan and levels of the land he proposes to develop.

Specifications.—A thorough knowledge of specifications is essential, and the candidate should be required to write a specification governing every part of his design, with the assistance of a skeleton specification to work upon.

Sanitary.—The general laws laid down by sanitary experts should be known by memory, both for a building in the country and in a town ; he should know how to test drains and to check the deception practised by contractors. For weights of pipe, etc., books of reference might be allowed.

Decoration.—Without the qualification to blend colour, many an otherwise good building would be ruined. Decoration should have strict attention and rigid examination.

Time for the Examination.—Two weeks, at least, is necessary to do justice to the subject. Some are much slower in their work than others ; ample time should therefore be given, so that the slow and thorough should have the same opportunity as the quick.

I have endeavoured to show by this paper that I would expunge from the examinations all unnecessary questions, such as : "Where does olive oil come from?"; "Who was Xenophon?"; geography, languages (except English), mathematics (beyond that portion required in an architect's practice), dilapidation, chemistry of materials, history, and all other subjects unnecessary to the uplifting of architecture in the true sense of the work.

We are living in an age of construction unlike any the world has ever before experienced. I mean steel construction ; yet there has not been a successful attempt to apply it architecturally. Why is it so? Because architects of the present generation are trained to slavishly copy and study the works of architects in stone and wood. Under the present system of tests, the man who has the best memory holds the best position in the examination. It should be the man who answers the most practical questions best should be given the first place.

*A paper read before the Society of Architects, London, on December 18th, 1900.

Branch Office of the CANADIAN ARCHITECT AND BUILDER, Imperial Building.

MONTREAL, March 15th, 1901.

THE SPRING EXHIBITION.

The annual exhibition of pictures at the Art Association's galleries was opened on Friday, March 8th, and will remain on view until the 23rd inst. As usual there was not much interest shown in the architectural drawings, but then we regret to say there was little in which to take interest Outside of Mr. W.S. Maxwell's drawing of a "Salle des Fetes" made by him during his recent stay in Paris in the "Beaux Arts" style of rendering there was not much of note, and in point of numbers the exhibition was woefully wanting. Mr. A. T. Taylor exhibited a water color sketch of the Merchant's Bank building for Winnipeg and a sketch of a small bank building at Sydney, C. B. The latter is a type of building which should be largely in demand in Canada as there will, no doubt, be several small towns cropping up in the next ten years desiring buildings of this class. Why do not persons interested in the arts and crafts exhibit drawings and sketches of decerations and interiors, ornamental grills, and other iron work, lamps, etc., and such work as is to be seen in the pages of the Studio? Surely there is a growing demand for these things in Montreal, and the ladies who are generally interested in interior decoration have a field open here for them. The exhibition of china painting certainly seems to have called forth the energies of the ladies, and we give them hearty praise for the display which does them credit.

THE BOARD OF TRADE FIRE.

The recent disastrous fire which demolished the Board of Trade, besides several other buildings in that district, has occurred since our last letter. The lessons to be learnt therefrom were chiefly those which ought to have been learnt long ago, viz., the lack of men and apparatus in the fire brigade ; the great drawback received from the net-work of telephone and electric wires in a congested district ; the fact that a fire wall is about the only thing that will stop a large conflagration, and the necessity ot better, that is, fireproof buildings, in the centre of a large city. The improvement of the fire brigade is out of our province, except when we are commissioned to build a new fire station, and we would like to urge here that the city council be called upon by an amalgamation of the art interests of the city to insist upon either competitive plans or a competent local architect being employed for any new fire stations that may be required, and are evidently badly needed according to the report made recently by Mr. Howe to the Canadian Fire Underwriters.

Concerning the numerous wires we would like to add our voice to that of others in recommending that the city council enforce the various companies in the congested district, that is where the insurance companies have raised the rates, to place their wires in a large conduit underground. If need be this could surely be done by an outside company and space rented out and thereby make a good precuniary profit to themselves, and at the same time do the citizens as a whole a lasting benefit. There is no doubt that the overhead wires are a menace to the public at all times, while in the event of heavy storms or a fire they are a danger that is too great to be trifled with and a great cause of expense to the companies, that one would imagine for their own sakes any attempt to force them to place them underground would not be met with any very strong opposition.

From an architect's standpoint there is the further disadvantage in the ill effects they have on the vista down some of the chief streets of this city with whole rows of poles carrying their network of wires.

Montreal is gradually growing to be one of the large cities of this continent and in which fierce commercial competition is being met on all sides, and merchants have now to compete against merchants from all over the world. They can, therefore, ill afford a raise in the insurance rates, as they have by force of circumstances to scrutinize every item of expense. Merchants can also, as a rule, ill afford to have a fire, as an interruption of their business generally means their customers going over to a competitor. They should, therefore, look beyond the first cost of a building and see that they are protected somewhat against loss by fire. Do not blame the insurance companies for the raise in the rates, but blame yourselves, ye who build such firetraps as are to be seen throughout the city. Can one blame the insurance men when there are buildings in the centre of a congested district with absolutely no protection whatever against fire—no sprinklers, no standpipe with hose connections,—or even if there is a standpipe a hose without a nozzle, as can be seen in one of the largest office buildings in this city. Such things should not be allowed, and if persons who own such property have not more thought for the lives and property of their tenants there should be some law which would enforce them to do so.

THE LICENSING OF ARCHITECTS.

The question of the value of licensing architects should be of vital importance to all those concerned in the welfare of the profession in the Province of Quebec. As is well known "no person" in this province can take " or make use of the name or title of architect, either simply or in connection with any other word, name, title or designation, giving it to be understood that he is an architect under this act unless he is registered under this act as a member of the said association." Any person since 1898 using the word "architect" in the Province of Quebec, unless registered, is subject to a fine not exceeding twenty-five dollars ($25.00) for the first offence andnot exceeding one hundred dollars ($100) for every subsequent offence.

In the State of Illinois, the only state at present with a license law in the United States, all architects after passing the final examination are given a seal with their name and address impressed thereon with which all plans emanating from their office have to be stamped ; and further-more, no building permit will be issued except on plans so stamped with the seal of a licensed architect. This appears to us to be carrying the thing too far, as no man should be hindered from erecting buildings from plans of his own, or without any plans for that matter if he so desire, but he should be restrained from employing another person to make plans for him who is not a licensed architect. A man can doctor himself or plead his own case in court, but in neither case can he practise medicine or law without a license. In New York State they are now discussing the pros. and cons. of licensing architects, as a bill is before the legislature. There seems to be opposition both from some of the architects and the general public, and the outcome seems doubtful. The chief points usually brought to bear against a bill for licensing architects is the undoubted impossibility of testing the artistic merits of a candidate by an examination. This is almost universally acknowledged to be a difficulty, but it is possible to test whether he knows the rules governing both the artistic and the scientific sides of his profession. Any person practising architecture, which is now generally acknowledged to be one of the learned professions, should be able to pass a general examination equal to the standard required by the medical or legal fraternity. He should further-more, in a final examination, be able to pass in the following subjects : Perspective and free hand drawing ; shades and shadows ; mechanics ; elementary geology and botany ; hygine ; modelling ; building construction and materials ; pen and ink drawing and wash work ; colour and decoration ; history of art and architecture ; design ; specifications and contracts ; architectural jurisprudence.

Of course a candidate might pass in all these subjects very creditably and yet not make a "great" architect, but at least one would know that he was in a position to build safely and correctly and would not contravene all rules of good taste. This is as much as can be said of any profession, and there will and almust be many grades in every calling. There is now undoubtedly a growing tendency on the part of the general public to appreciate intelligently the difference between good and bad in architecture, and it is the duty of all architects to keep out of the profession all those who hinder its progress.

Now that the Quebec Association has received its charter and has had time to get down to work, it is high time that something should be done to teach students, as this responsibility has by this charter been thrown upon the shoulders of the Association. There is at the present time no attempt to do anything to further the interest taken by students or to place before them the opportunities for serious study. It is the earnest desire of many to see some form of study in the way of lectures, modelling classes, etc., and also monthly competitions started by the Association, and we trust if too late for this season, there will not be another year pass without some effort by all the members to see that this blot does not remain on our work. Surely the Association could join the American League and so obtain the circuit drawings as was recently done by the Toronto Architectural Eighteen Club. "The Brickbuilder" recently commented on that exhibition by saying, "The first Architectural exhibition of any pretensions ever held in Canada occurred in Toronto, January 26th to February 9th, under the auspices of the Toronto Architectural Club, and from all points of view it was voted a success and heralded as a permanent entry on the part of the architects of Canada into the progressive movement for the advancement of architecture and municipal arts." Let not this progressive movement stop until it at least includes Montreal, and it is a splendid opportunity for both members and students to compare their work with that which is being done by others, and there is nothing like a healthy comparison of work to make and stimulate an interest in one's own. We would like to suggest that the Association should offer prizes for monthly competition during the winter months, the prizes to be given on a vote of members, as is done in the T Square Club. Possibly some of the honorary members might be glad to offer a prize or medals, and I fancy one or two at least would certainly come forward if asked. Surely the days ought to be past when men were afraid lest some one else should steal their ideas and so frustrate any attempt at co-operation or "esprit de corps."

SCHEDULE OF CHARGES OF THE P. Q. A. A.

An order-in-Council was passed by the Quebec Legislature on the 8th inst., legalizing the schedule of charges of the Province of Quebec Association of Architects, as follows:

No. 1—The architect bases his professional charges upon the entire cost to the owner of the building when completed, including all the fixtures necessary to render it fit for occupation, and is entitled to extra compensation for furniture and other articles designed or purchased by the architect.

No. 2—If any of the material or work used in the construction of the building be already upon the ground or come into possession of the owner without expense to him, the value of said material or work is to be added to the sum actually expended upon the building before the architect's commission is computed.

No. 3—Travelling expenses are to be paid by the client.

No. 4—The charge per day which may be made by an architect will depend upon his professional standing, but the minimum charge will be $10 per day.

No. 5—In all cases where an architect is subpoenaed professionally as a witness in court, he shall be entitled to a fee of $4 per day of attendance.

No. 6—Drawings and specifications, as instruments of service, are the property of the architect.

No. 7—In consideration of the charges mentioned hereafter, the architect will be held to furnish a series of drawings and specifications as originals, and copies of these same drawings and specifications for the use of the contractors, but it will be well understood that all the originals and copies must be returned to the architect when the work will have been completed.

No. 8—For professional services in connection with all buildings, comprising preliminary studies, complete plans, specifications, details and superintendence, the architect will be entitled to a commission on the total cost of the building when completed, in the following proportion:—

On all classes of buildings costing less than $50,000, 5 per cent.

On all classes of buildings costing from $50,000 to $150,000, 4 per cent.

On all classes of buildings costing more than $150,000, 3 per cent.

No. 9—Partial charges, in the case of subdivision or discontinuation of the work, will be as follows:—

For preliminary studies (sketches), one-fifth (1/5) of the above charges:

For complete plans and specifications, including the preliminary studies, one-half of the above charges (½).

For details, one-fifth (1/5) of the above charges.

For superintendence of the works, when drawings are not furnished, two and one-half per cent. (2½) on the cost of the works.

No. 10—In exceptional cases, for all works of alterations or of restoration, the architect will be entitled to a commission of seven and one-half per cent. (7½) of the cost of the work.

No. 11—For all other work (also exceptional) in which the expenditure is mainly for artistic workmanship, viz.: For monumental work, fittings and furniture, and for decorative work, stained glass and such like; the architect will be entitled to a commission of seven and one-half per cent. (7½) on the total cost of the work.

No. 12—For valuations of property requiring measurements and detailed estimates, where the value will not exceed $5,000, one and one-half per cent. (1½). Where the value exceeds $5,000, the commission will be one and one-half per cent. (1½) on the first. $5,000, and one per cent. on the remainder (1).

No. 13—In case the owner of the building or the contractor should require the services of the architect to prepare quantities or for measurement of the work done or to be done, such services will be paid (outside of the regular commission) at the rate of two per cent. (2) on the valuation of the cost of the work.

NOTES.

On severing a connection covering seventeen years with the firm of Millar Bros. & Toms, Montreal, Mr. A. M. Elliott, was presented with a gold watch by his fellow employees and with a chain and locket by Mr. J. D. Millar on behalf of the firm.

Another competitor in the brick market has recently been heard from, viz., "the Drury brick" from Essex county, Vermont. It stands a good absorption test but is smaller than most bricks made in Montreal and requires about 23 bricks to the cubic foot instead of from usually 20 to 21 Montreal bricks.

The death of Mr. Jacobi, an artist well-known in Montreal, and a former president of the Royal Canadian Academy, removes one of the older artists in Canada. He was born in February, 1812, at Konigsberry in Prussia and came to Canada in 1860, where he remained, with the exception of a short absence, until shortly before his death, which occurred in Dakota.

The result of the recent examinations for the Architectural Association has just been posted: H. C. Stone, of Montreal, and Pierre Levesque, of Quebec, are granted licenses to practise as architects in the province, and the following passed the preliminary examinations: Sholto Smith, of Montreal, J. J. T. Donelly, E. P. Raymond and Charles A. Lemay, all of Quebec.

Mr. Dore, sanitary engineer, Montreal, examined during the month of January 17 building plans, visited 147 homes where plumbing required inspection, issued 16 notices about improper workmanship, and issued four plumbers' certificates. He complains that many plumbers are using lighter material than the by-law calls for.

Mr. J. O. Marchand, who enjoys the distinction of being the only Canadian student of architecture at the Ecole des Beaux Arts, at Paris, has recently resumed his studies after having paid a brief visit to his parents in this city. Mr. Marchand expects to obtain his final diploma in June, after which he will begin the practice of his profession in Montreal.

Mr. Charles Philippe Hebert, the Canadian sculptor, has been made a Knight of the Legion of Honor by the French Government in recognition of his services to art in France and Canada. The Maisonneuve monument in this city, a group of historical figures on the facade and in front of the Legislative Buildings at Quebec, and the statues of Sir George E. Cartier and Sir John A. Macdonald, at Ottawa, are among his most important works.

It is announced that from May 1st until June 30th classes in drawing, painting and modelling, open to men and women students, will be held in the rooms of the Architectural Department of McGill, under the direction of Prof. Henry F. Armstrong. The rooms will be open on week days from 10 a.m to 5 p.m. Students may pursue their studies in one or more of the subjects continuously every day. Teaching and criticism will be given daily during the above hours, except on Saturdays. The subjects taught will be:—Freehand drawing, in lead pencil and in charcoal, for students preparing for, or engaged in, any branch of art work, and in lead pencil, for engineering and other science students; oil painting and water color painting; and modelling in clay and casting in plaster.

Prof. W. R. Butler read some abstracts before the Canadian Society of Civil Engineers on February 28th from two papers recently given before the Liverpool Engineering Society, termed "The Characteristics and Qualities of Portland Cement" by Mr. P. A. H. Shaw, and "Experiments on the Artificial Acceleration of the Setting of Portland Cement," by Mr. F. E. Priest. In the first paper the importance of fine grinding was particularly emphasized and in speaking of the value of weight as a criterion of quality the author showed the variations in the weight of samples of the same cement at different ages as follows:

At age of one day,	weight	117	lbs.	per	bushel.
" 1 month	"	113	"	"	
" 2 months	"	108	"	"	
" 12 months	"	103	"	"	

And as examples of variation in weight due to fineness in grinding the following were quoted:

10%	residue on	80	mesh sieve	weighed	110	lbs. per bushel.
20%	"	80	"	"	116	" "
25%	"	80	"	"	121	" "
35%	"	80	"	"	123	" "

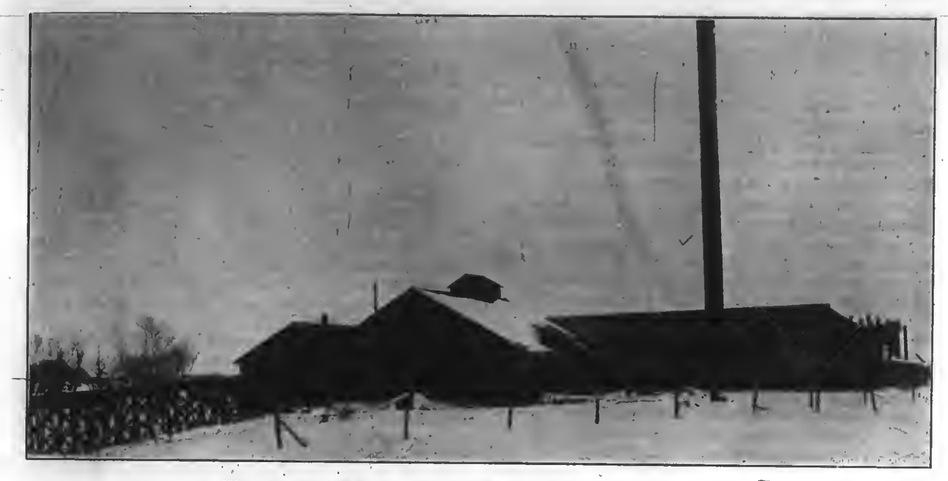
The above figures should be of interest to architects as well as engineers. J. R. G.

MANUFACTURES AND MATERIALS

THE MARITIME CLAY WORKS COMPANY, PUGWASH, N. S.

(Correspondence of the CANADIAN ARCHITECT AND BUILDER.)

During the past two years a new and modern brick making plant has been in process of construction in Pugwash, N. S.



WORKS OF THE MARITIME CLAY WORKS COMPANY, PUGWASH, N. S.

This has now been completed and for some time has been turning out heavy shipments. It is unnoubtedly the largest in the Maritime Provinces and is thoroughly modern in every respect ranking among the finest in the Dominion.

The natural advantages of the site were good and the clay and sand required were in close proximity, of the best quality and inexhaustible. There were old clay works here forty years ago and some of the old buildings still stand, but they were quite small.

Robert Brownell, of Truro, was one of the early promoters of this concern. The late Hon, Mr. Dickie, of Amherst, saw the advantages of the site and took up the work, furnishing until his death much of the means for construction. After that event the present members of the firm bought out the stock and plant and have since made great changes and improvements to the plant.

The present members of the company, incorporated in 1898, are Alonzo Smith and R. M. McDonald, both natives of Pugwash. They are both good business men and are opening up the business as thoroughly as it can be done.

The plant is located immediately across the river from Pugwash and is connected with the clay beds, one and a half miles distant, by a railway which is the firm's property.

The clay beds form a solid bank, twenty-five feet high and about a mile in length. The quality is extra good, some experts say among the best they have ever seen, and there is not a stone to be found in it.

The railway was constructed last summer and is fitted with a locomotive and good rolling stock. It terminates in the factory over a high trestle so that cars may be run up over the machinery and easily dumped. The sand is obtained from the harbor shore, a few hundred feet from the mill and is of clear and even quality in inexhaustible quantities.

The buildings and yards cover a great area and are laid out as conveniently as possible. The buildings are all of brick, and are covered with heavy galvanized iron roofs. The main building is of size about 75 x 100, including the shed for clay, etc. The engine and boiler rooms are attached, of a size 30 x 24. The engine is of 80 h. p., and there are three boilers, two of 75 h. p. each and one of 50.

There is some large and powerful machinery in the machinery building. All his apparatus came from Bucyrus, Ohio, and is of the latest pattern. The wire cutting machinery has a capacity of 35,000 bricks per day. The dry press machine has a capacity of 20,000 a day, though it is not generally operated at that speed. The dry house is about 100 x 40 of 6 chambers and with a capacity of 40,000 per 24 hours. The exhaust steam from the engines goes into the dry house. A fan which will be put in this winter will increase the capacity to about 50,000.

WORKS OF THE MARITIME CLAY WORKS COMPANY, PUGWASH, N. S.

The old wooden kilns at first used have been done away with. The plan of the new continuous kiln were obtained in California and is the only one of the kind in the Maritime Provinces. The size is 164 x 52, and its capacity for the 18 days required for a burning is 450,000.

The daily capacity of this kiln is just about 35,000. Its construction requires care and skill and its cost was great, but is well justified by results. The mouths or doors to the chambers are closed and cement sealed during burning. The contents of a chamber may be removed and the chamber be filled again while the rest of the chambers are in full heat. Coal is used, and this fuel, in very fine condition, is fed through many small intakes overhead, sifting down through the bricks to the bottom. There are 1,200 ormore of these feeding holes, ot a diameter of about 4 in., each provided with a cover. This new kiln was just started last September.

As much as 35,000 stock and 10,000 pressed brick have been turned out in a day. All future orders can be filled up to 30,000 bricks per day.

A small artificial kiln stands near the continuous one, which though only of about 12 feet diameter and 10 feet high, has a capacity of 17,000.

In the spring a new building 20 x 40 is to be constructed to contain burned and dry bricks. Then all parts of the work and stock will be fully under cover. New tracks will be laid to the wharves and other improvements carried out.

The large chimney belonging to the works is 140 feet high and over 6 feet in inside diameter.

About 40 men are now employed in the works. So much machinery is now used the old number has been much lessened.

Altogether the plant has cost about $62,000 including from $4,000 to $5,000 for site and about $3,000 for rolling stock.

Large shipments have been made to Sydney to the Dominion Coal Co., the Dominion Iron and Steel Co., N. S. Steel Co. and Rhodes, Curry & Co., Cumberland Coal Co. (160,000 M). Orders are in hand for a quarter of a million to Sydney, about 1,000,000 to Prince Edward Island and half a million to Pictou county. A considerable quantity has been shipped to New Brunswick, including an order of 20,000 to Kingston.

At present the bricks are taken over the river to the railway a distance of some few hundred yards in lighters and tugs, but it is the intention to put in a wire cable carrying system which will solve this difficulty.

More business has been found than was anticipated, and the operation of the new plant is in every way successful.

THE COMPOSITION OF SOME CANADIAN LIMESTONES.

(A) For Calcium Carbide; (B) For Chemical Wood Pulp; (C) For Portland Cement.

BY J. T. DONALD, M.A., Montreal.

The rapid development of industries in which lime or limestone is a raw material has given a new interest to this common mineral. The term limestone, however, as generally used includes any rock in which carbonate of lime is the predominant ingredient. This of course gives a wide range of composition. The ideal limestone is pure calcium carbonate containing 56% of lime and 44% of carbon dioxide.

The conditions under which beds of limestone have been deposited were such that it is scarcely possible to find them fully up to our ideal in degree of purity.

Being a sedimentary rock, we usually find limestone containing more or less siliceous matter, either as silica or as silicates. The amount of siliceous matter may vary from a few tenths of one per cent., up to even forty or fifty per cent.; in which latter case it is a question whether we should consider we have a sandy limestone or a calcareous sandstone.

But again, in nature we usually find that carbonate of lime is associated with carbonate of magnesia; indeed it is scarcely possible to find a limestone that does not contain an appreciable percentage of magnesia; whilst on the other hand the magnesia may occur in such percentage that the stone becomes a magnesian limestone or Dolomite, which normally contains: Lime 30.40%; Magnesia 21.70%; Carbon dioxide 47.90%.

In addition to silica or silicates and magnesia, all limestones contain more or less of what someone has aptly called the "Intruder into everything on earth" viz., iron in the form of iron oxide or iron sulphide.

The principal industries that call for limestone as one of their raw materials are: Calcium carbide, Chemical Wood pulp, Portland cement.

The object of this brief paper is to state in a general way the characters of the limestone required in each of these industries, illustrating by reference to Canadian limestones that have been analysed by the writer.

(A) Calcium carbide.—A limestone to be suitable for the manufacture of this article should be as nearly as possible pure Calcium carbonate. The presence of magnesia is particularly detrimental. A small percentage of siliceous matter and a little iron oxide may be tolerated. These points are illustrated by the following analyses; 1 is being used in a Canadian Carbide works; 2 and 3 are unsuitable for Carbide: 2 because of the magnesia it contains; and 3 on account of the high percentage of siliceous matter.

	I	II	III
Insoluble	...	2.14	10.92
Carbonate of lime	96.89	52.00	87.71
Carbonate of Magnesia	1.64	42.71	.30
Iron Oxide	....	2.20	.70

(B) Chemical Wood Pulp—For soda pulp, i. e. pulp made by "cooking" the spruce or other wood in a solution of Caustic soda, any ordinary good lime-stone will yield a lime suitable for causticising the soda.

But in the case of Sulphite pulp, it is otherwise; selected material is required. In this case the presence of magnesia is desirable, indeed the higher the percentage of magnesia, the more desirable is the stone. But iron is decidedly objectionable; its presence causes discoloration of the pulp.

The following analyses are of Canadian limestones.

I is an excellent stone for sulphite pulp. II whilst good in other respects contains too much iron. III does not contain sufficient magnesia.

	I	II	III
Insoluble	2.10	2.14	.14
Carbonate of lime	56 21	52.00	98.78
Carbonate of magnesia	41.20	42.71	Traces
Iron oxide	.09	2.20	.19

(C) Portland Cement—This article is made by calcining a mixture containing proper proportions of silica, lime and alumina; this is usually a mixture of limestone and clay. A somewhat wide range of material is admissable in this industry. Magnesia is debarred to the extent that the finished cement must contain less than 3% of magnesia.

A limestone comparatively high in silica is admissable here, provided a clay or shale rich in alumina is obtainable.

A certain kind of impure limestone is the sole raw material for certain kinds of Portland cement. This is commonly known as natural cement rock. It is really an argillaceous or shaly or clayey limestone; that is, it is the materials for Portland cement ready mixed by nature.

The following analyses illustrate the statements just made.

I is an ordinary limestone suitable for cement. II contains too much magnesia. III is a natural cement rock.

	I	II	III
Insoluble	1.51	20.23	24.74
Carbonate of lime	97.21	50.37	41.80
Carbonate of magnesia	1.15	24.63	8.60
Iron oxide	.17	2.81	6.30

John W. Edwards and A. T. Hughes, slate manufacturers of Granville, N. Y., have returned from a trip to Newfoundland, and express themselves as much pleased with the slate prospects. A syndicate, in which Granville parties are interested, is now at work there.

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AGENTS FOR CANADA

A CORRECTION.

Toronto, Feb. 28th, 1901.

Editor CANADIAN ARCHITECT AND BUILDER.

SIR,—Mr. Bishop, Architect of the Public Schools, Toronto, has brought to my attention the report of my remarks at the recent Convention of the Ontario Association of Architects.

The rough report of my remarks was looked over very hurriedly, and I am sorry I am quoted as having said, "The ventilation of our schools was criminally neglected."

I have no recollection of using the words "criminally neglected," and certainly would not use them, but I think I was referring in my remarks to some 28 class-rooms which I inspected two years ago, used as a temporary accommodation.

Many of the schools are as regards fresh air well supplied if not overcrowded, and I am glad to learn from Mr. Bishop that arrangements are being made for supplying adequate moisture, and in new schools for mechanical means of ventilation.

I shall be obliged if you will give this note space in your next issue.

Yours truly,

P. H. BRYCE.

ENGINEERS VERSUS ARCHITECTS.

A lively game of curling was played at the Granite rink, Toronto, February 26th, when architects and engineers laid aside their T squares and wielded brooms instead. It was a close game throughout, the following being the score:

Engineers.	Architects.
W. R. Clement	A. H. Gregg
C. B. Smith	A. R. Denison
J. D. Shields	F. H. Herbert
C. H. Rust, skip—10	J. A. Pearson, skip—9.

Mr. W. H. Elliott, of the Elliott & Son Company, the well known decorators of Toronto, accompanied by Mrs. Elliott, is on his way to Europe. His intention is to visit the leading art centres in Great Britain and on the continent.

NOTES.

Mr. H. S. Griffith, architect, of Winnipeg, has recently taken into partnership Mr. Thomas Kennedy.

Mr. F. Neil Brodie has recently opened an office for the practice of architecture at 42 Princess St., St. John, N. B.

Mr. Harry Staveley, the well known architect of Quebec, has taken into partnership his son, Edward B. Staveley, who recently completed a course of study in the architectural department of McGill University, Montreal.

Dr. A. P. Coleman, Professor of Geology at Toronto University, and geologist to the Ontario Bureau of Mines, has been appointed Director of the Geological Survey at Ottawa, in succession to the late Dr. G. M. Dawson.

A cable dispatch brings intelligence of the death in action in South Africa of Mr. Frank Douglas of the Oxford Yeomanry, who was formerly a pupil in the office of Mr. D. B. Dick, architect, Toronto, and who has many relatives still residing in that city.

A very pleasant event occurred at St. Thomas a few days ago, when the warden and members of the county council of Elgin waited upon Mr. Darrach, architect of the new county buildings, and presented him with a complimentary address accompanied by a photograph of the new buildings. The committee stated that the result of Mr. Darrach's work had far exceeded their expectations.

Mr. Thomas R. Short, who has been declared the winner of an important competition for model tenement houses for New York, is a native of Hamilton, and was a student in the office of Mr. James Balfour, architect, of that city. Mr. Short has resided in New York since 1885. In the above mentioned competition there were 170 competitors and 308 sets of plans.

According to the Wallpaper News, of New York, a paper that will retain painted or printed characters, and that can be washed, disinfected, or scrubbed, is now made. The paper, either before or after printing, is gelatinized, and then treated with a solution of formaldehyde, which renders it thoroughly waterproof and impervious to moisture. It is especially suitable for wallpaper.

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Architects

WRITE J. H. MORRISON SOLE AGENT TORONTO

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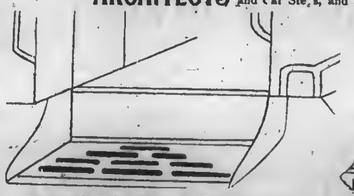

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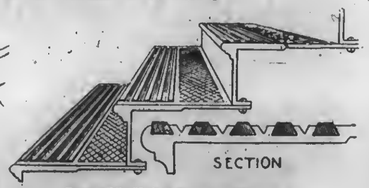

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THE British Fire Prevention Committee are organizing a novel demonstration in the form of a fire-proofing section in connection with the Biennial Building Trades Exhibition at the Agricultural Hall, London, in April. A large gallery has been retained for exhibits showing progress made in combating fire by improved materials and systems of construction. This exhibition will not not only be the first of its kind in any country, but will show that the reduction of fire risk by improved forms of building has now its own independent industrial position, claiming not only the attention of professional men but the study of our local authorities.

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Mr. W. T. Dalton, a well known British Columbia architect, has recently returned from a three months visit to England, New York and Boston.

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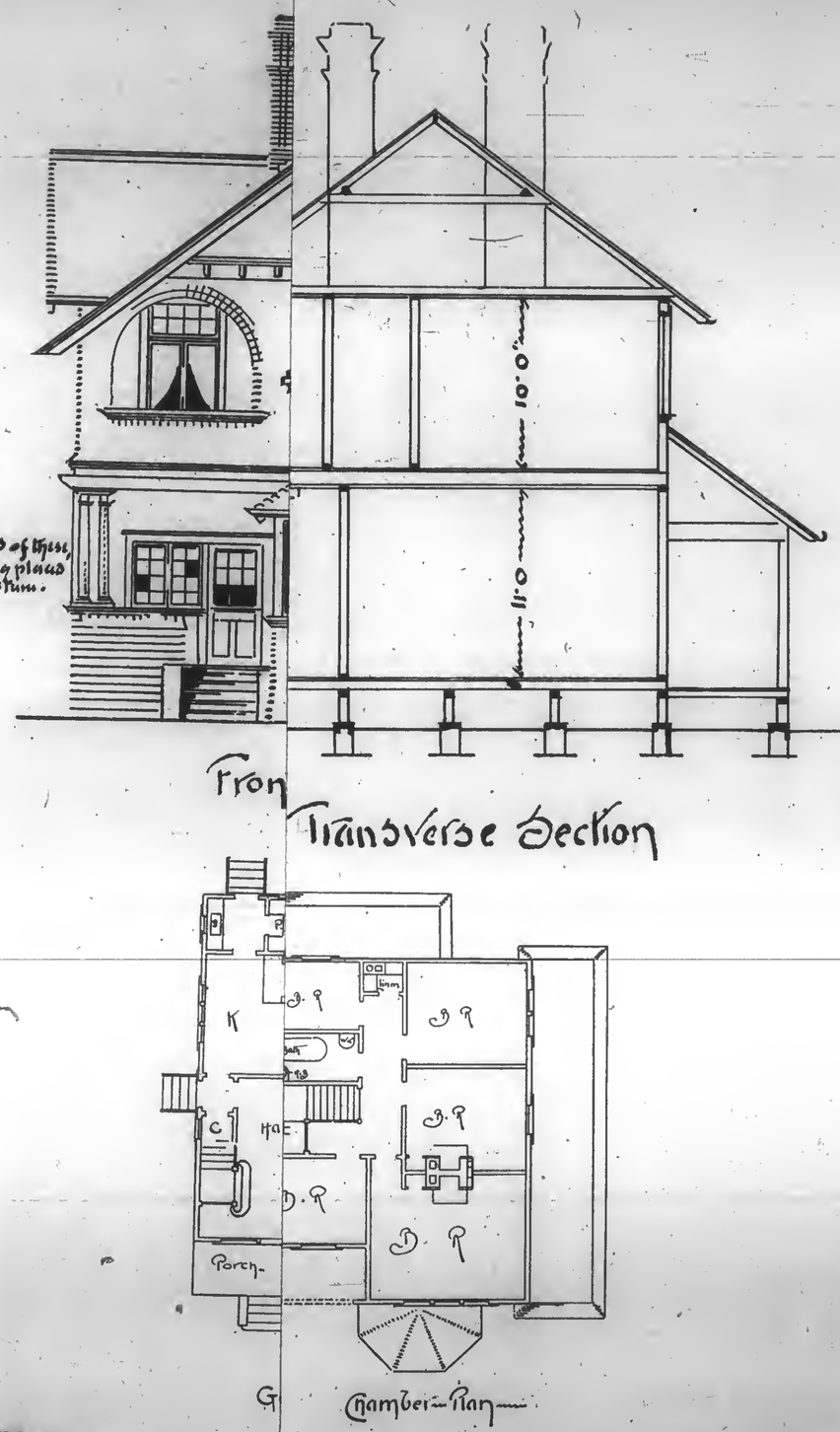
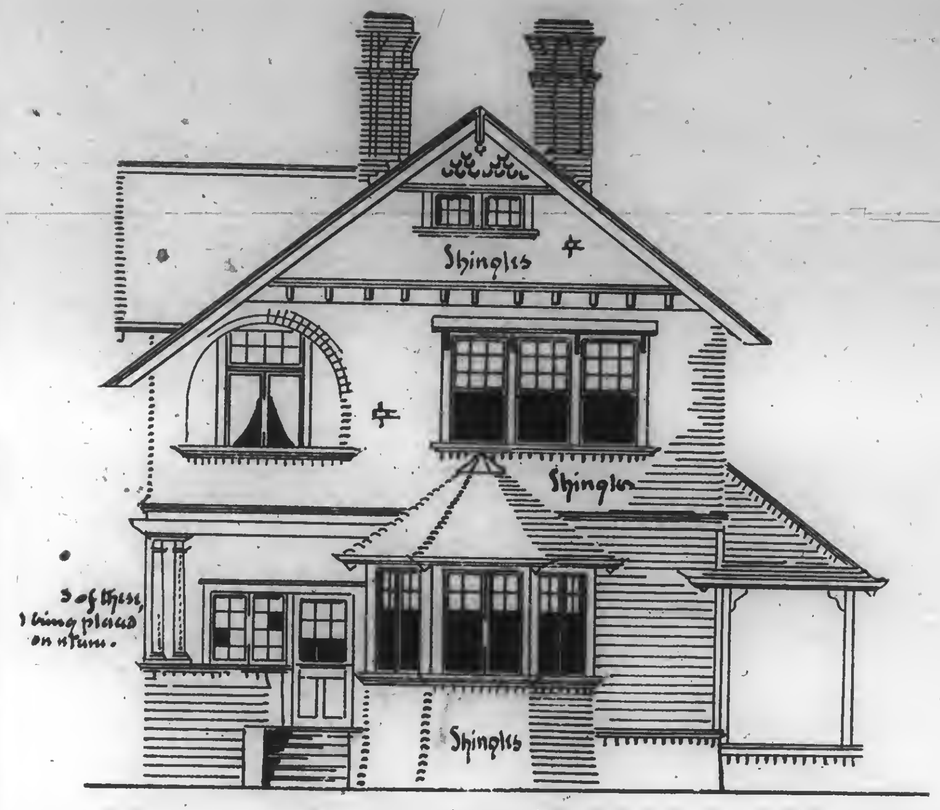
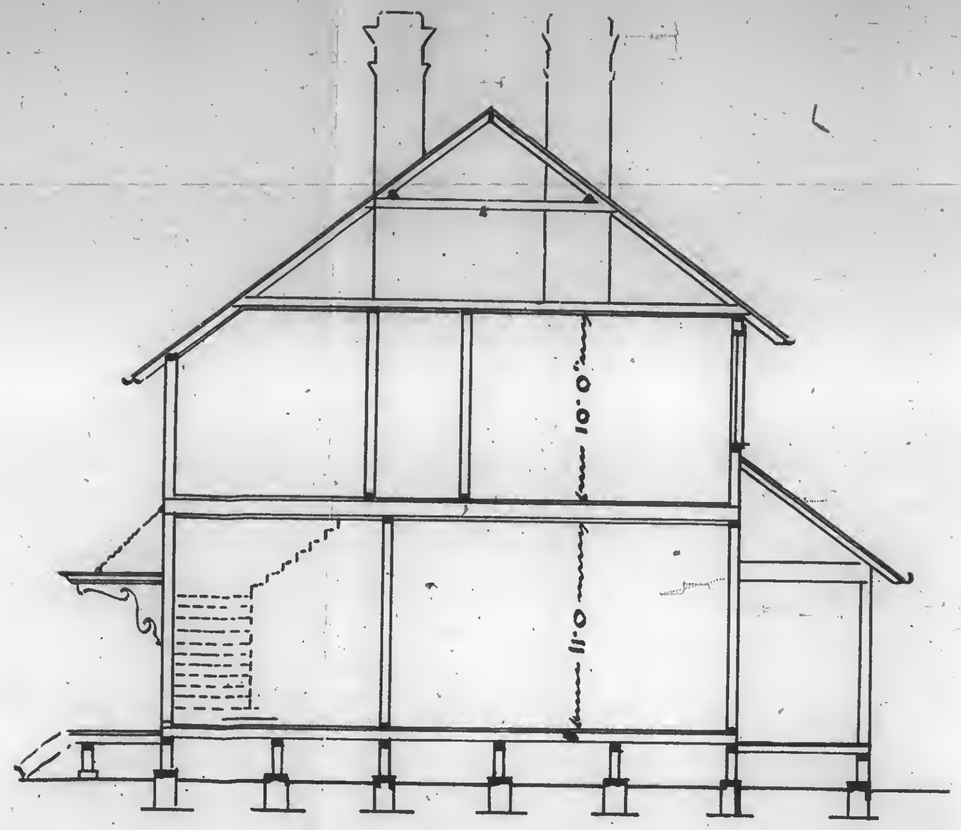
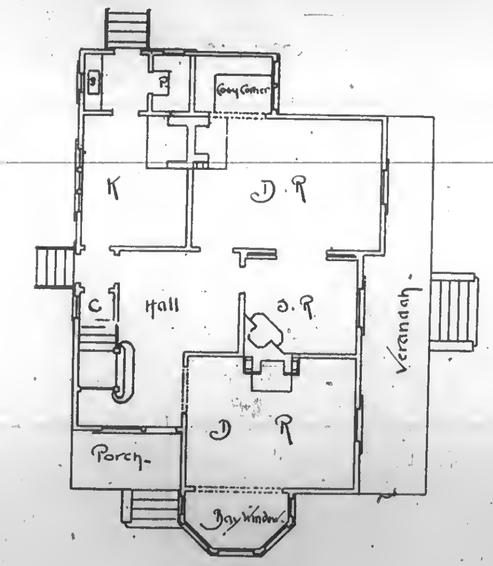




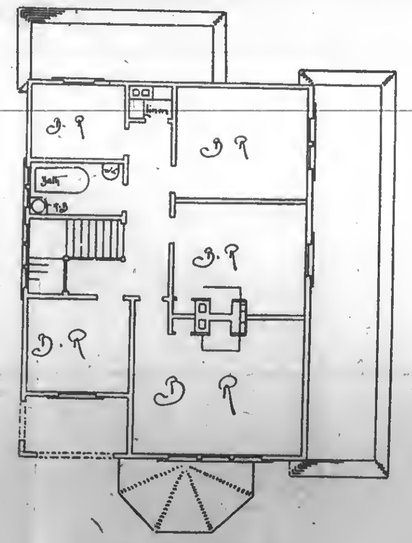
Front Elevation



Transverse Section



Ground Plan



Chamber Plan

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
MARCH, 1901.

DESIGN FOR MODERATE COST HOUSE.
R. M. FRIPP, F.R.I.B.A., ARCHITECT.

South West View.
Summer Cottage at Onteora, Catskill Mountains.
Designed by G. A. Reid, R.C.A.

North East View.

Interior View of Living Room.

Interior View of Church, at Onteora, Catskill Mountains.
Designed by G. A. Reid, R.C.A. — Decoration Painted by Mr. Reid.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
MARCH, 1900.

Illustrations Accompanying Paper in this Issue by Mr. G. A. Reid, R.C.A., on "The Summer Cottage and its Furnishings."

ACCEPTED DESIGN FOR PROPOSED NEW TORONTO HOTEL.
HENRY IVES COBB, ARCHITECT.

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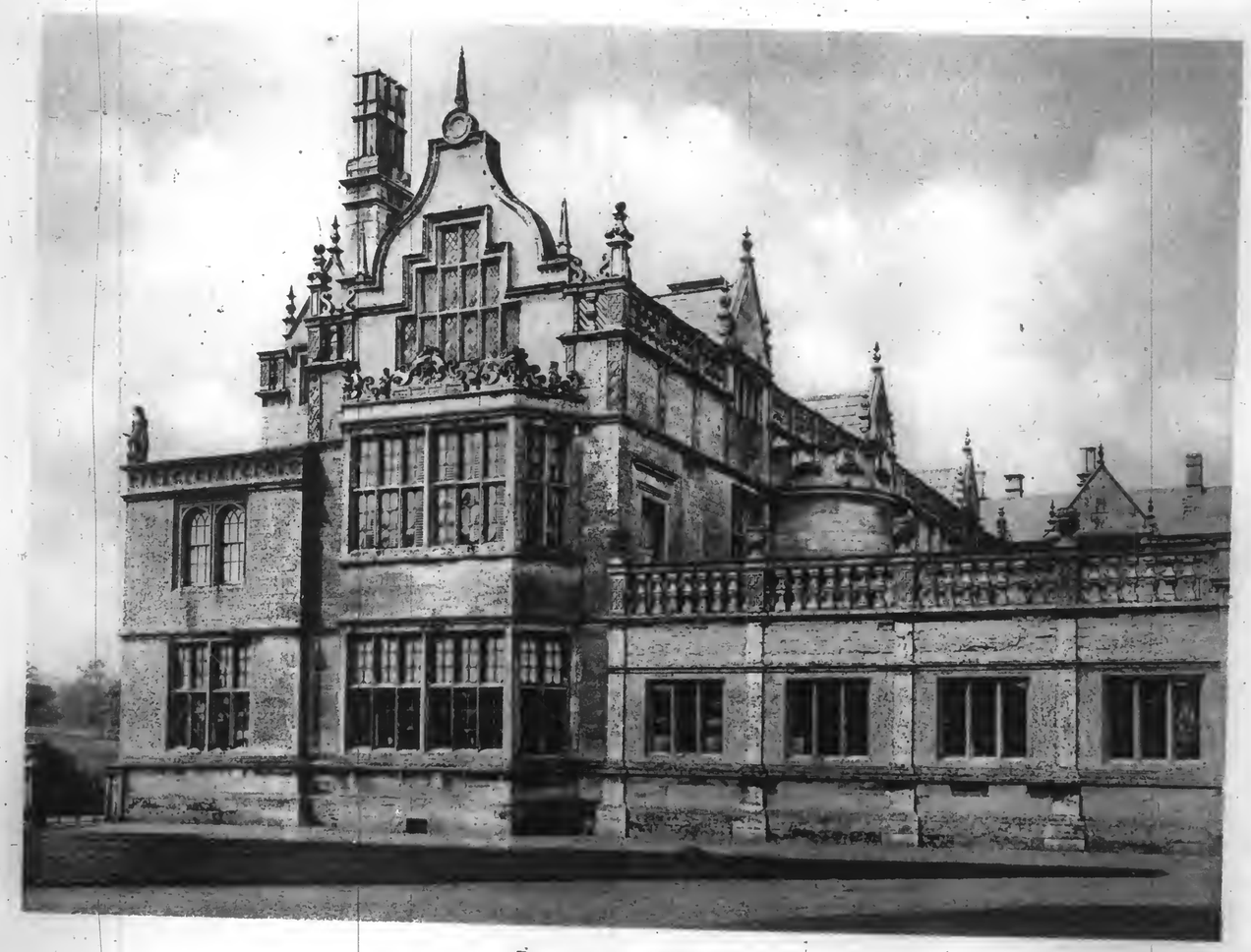

RUSHTON HALL, ENGLAND.

DETAIL OF PART OF EAST FRONT.

INTERIOR OF FRANCISCAN CHURCH, QUEBEC.

BERLINQUET & LEMAY, ARCHITECTS.

The Canadian Architect and Builder

VOL. XIV.—No. 160. APRIL, 1901.

ILLUSTRATIONS ON SHEETS.

Designs of Small Houses and Cottages—Illustrating Paper in this Number by Barry Parker and Raymond Unwin.

ILLUSTRATIONS IN TEXT.

Design for Cottage at Toronto Island—By Chas. Lennox.
United States Government Building, Agricultural Building, and Plan of Grounds, Pan American Exhibition.
Illustrations accompanying Paper on Landscape Architecture by Frederick G. Todd.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Photogravure Plate—Residence at Ottawa—A. M. Calderon, Architect.
" Facade of Cathedral at Ferrara, Italy.
Stained Glass by W. Bloomfield & Son, Vancouver, B.C.
Sculpture for the Pan-American Exhibition Buildings.

CONTENTS.

Editorial Notes	69-70	History of the Ontario Association of Architects	81-82
The Preferential Tariff and Transportation	70	Ontario Association of Architects	82
The Art of Designing Small Houses and Cottages	71-75	Proposed New Building Regulations	83
Corrosion of Soft Steel and Wrought Iron	75	Students' Department	84
British Columbia Letter	76	Causes of Varnishing Failures	85
Landscape Architecture	77-79	The Use of the Gasoline Torch and Fire Insurance	86
A New Idea in Heating	79	Twenty-second Annual Exhibition of the Royal Canadian Academy of Arts	88
Modern City Making	80		

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" S. H. TOWNSEND, " "
" FREDERICK G. TODD, Landscape Architect, Montreal.
" R. A. L. GRAY, Electrical Engineer, Toronto.
" W. H. ELLIOTT, of Messrs. Elliott & Son Co., Toronto.
" J. C. B. HORWOOD, Architect, Toronto.
" A. F. DUNLOP, R.C.A., Architect, Montreal.

Decoration of the Grand Dome at the Glasgow Exhibition.

WITHIN the brief space of six months two young Glasgow artists, Mr. John Dall and Mr. David S. Neave, neither of whom had any previous experience in mural painting, have successfully planned and executed a scheme of decoration for the grand dome of Glasgow Exhibition. The space to be covered measures 226 feet in circumference and 65 feet in height. Within this space have been placed thirty-two figures. Each figure has been cut out of its canvass and hoisted into its place, where it is fixed to the wall. On the cup or curved portion of the dome two large-winged angels with palms and laurels face one another, each with an attendant figure at either hand, the composition being connected by six groups of flying amorini. A gilt frieze runs round the circle, and below this are fitted at the window spaces eight seated figures in four groups, symbolic of industry, commerce, science and art. The whole is set in a very decorative landscape background.

The School of Practical Science.

It is gratifying to state that the Ontario government have promptly responded to the request of the students and interested bodies for increased accommodation and better equipment at the School of Practical Science, Toronto. The goverment's determination to erect an entirely new building for the purpose is a wise one. The estimated cost is $200,000, but a larger sum will be expended if the requirements should demand it. The designing of a building for such a purpose will afford scope for architectural ability of a high order. Probably the most satisfactory method of procuring a carefully designed and planned building expressive of its purpose and adapted to the requirements, would be to institute a competition for designs under conditions to be approved by the Ontario Association of Architects. The government should give the winner of the competition opportunity to inspect the most important buildings of similar character in the United States, the desirable features of which should be incorporated in his plans. The determination to spend so large a sum upon the erection of a building, the equipment for which will call for a further considerable expenditure may be taken to mean that the government propose to establish one thoroughly efficient scientific school in Ontario, instead of dividing the money at its disposal between two or more institutions. We strongly sympathize with this idea. Let us have one provincial university and one scientific school which will compare favorably with those of other countries, rather than a number of such institutions which because of insufficient revenue must necessarily be more or less inefficient.

The Licensing of Architects.

THE American Architect correctly points out as one of the objectionable features of the Illinois law compelling all architects to be licensed, that it restricts the practice of architecture to architects resident within the state. The Quebec law on the contrary admits to practice within

the province all architects who are certified to be members in good standing of an architectural institute or society, as well as persons who have passed the qualifying examinations prescribed by the Province of Quebec Association of Architects under authority of the Quebec Architects' Act.

The Building Outlook.

THE indications point to a season of considerable activity in building. A majority of the architects are now busily engaged on plans of new structures and alterations to existing buildings. Quite a number of contracts have already been let in Ontario, but in the eastern provinces the weather is not sufficiently favorable for the commencement of operations. The bulk of the contracts are believed to be as yet unsigned. Many architects and building owners prefer to wait until the market for materials and the scale of wages for the season can be accurately gauged. Conferences of employers and employees in several of the trades have been held, resulting in agreements to advance slightly the scale of wages. It is not believed however that these advances will in any degree hinder the carrying forward of building enterprises. Prices of materials remain steady. The high price of lumber undoubtedly checked building progress last year. Some projects were held over in the belief that lower prices would rule this season. Such is not likely to be the case however. The activity of demand, coupled with the growing scarcity of good lumber has prevented any decline, and prices are likely to rule higher rather than lower in the future. In Toronto the growth of population calls for a large increase in house accommodation, and considerable activity is already manifest in that direction. The erection of the new Toronto hotel, the site for which is now being cleared, will afford an outlet for large quantities of materials, provide employment for a small army of artizans, and be the means of greatly improving the appearance and trade of a locality which for some years past has suffered a decline.

THE PREFERENTIAL TARIFF AND TRANSPORTATION.

The preference of 33⅓ per cent. which is granted by the Canadian tariff to British manufactured goods entering Canada, appears not likely to benefit British manufacturers to any considerable extent. The reason is that United States manufacturers, in their determination to maintain their hold on the Canadian market, are cutting the prices of their goods to Canadian buyers to the extent necessary to enable them to undersell the British manufacturer, notwithstanding the advantage which the latter enjoys under our tariff. In order to do this, United States manufacturers are selling their goods in Canada at prices much below those charged to their customers in the home market. The only person, therefore, who is being benefited by the preferential tariff is the Canadian consumer.

Discrimination in railway freight rates also enables United States manufacturers to undersell Canadian manufacturers in their own market. As an illustration, we may take the case of corrugated iron. Every sheet of this material used by Canadian manufacturers must be brought into this country from the United States. Most of the material comes from Pittsburg. We find that the Pittsburg mills are selling the finished product to the customers of the Canadian manufacturers to whom they supply the sheets. On account of lower freight charges, the Pittsburg mills are able to ship the manufactured material to British Columbia, pay 25 per cent. duty, and undersell the Canadian manufacturer in that market. They can lay the finished product down at $1.00 per 100 lbs. plus the duty, while it costs the Canadian manufacturer $1.48. The Canadian Pacific Railway Company claim that they cannot meet the rates granted by the American roads, although their freight carrying facilities are not fully taxed. Surely it would be better for them to carry Canadian goods at a small profit and thereby help out the Canadian manufacturer, than allow his trade to go to the United States manufacturer and the goods to be entirely carried by American roads.

It will be seen that the tariff question has become one of the greatest importance in Canada. Some means of regulating rates and conditions are needed. Whether the proposal of the government to appoint a railway commission would effect the object in the most satisfactory manner is a difficult question to determine, and one which would largely depend on the powers and privileges granted to the railways by their charters. If such a commission is appointed, it should be entirely beyond political influence, and should be so constituted that the character of its administration would be continuous, giving opportunity for the members to become thoroughly familiar with the questions with which they would be called upon to deal.

The proposition has been brought before the Canadian Manufacturers' Association that the preference should only apply to British goods brought into Canada through Canadian ports. This proposition has in view the laudable object of building up Canadian seaports, but there are other phases of the question which are equally important and which must be taken into consideration. If Canadian manufacturers are to successfully compete with those of the United States for foreign trade, they must enjoy equal shipping facilities. It is evident that we can only bring to Canadian ports as many ships as we can supply with cargoes, and that the frequency of their arrival and departure must also depend upon the volume of shipments. With a population less than one-twelfth that of the United States, and with seaports much less advantageously situated, we cannot hope to be able to give our shippers for export as good facilities as they now enjoy by the use of American ports. Under the bonding privileges which now exist, they are placed on equal footing with the shippers of the United States, while if they were compelled to use Canadian ports, they would be subject to delays which would make it impossible for them to compete.

A DESCRIPTION of the granite sarcophagus in which the Prince Consort's remains were interred at Frogmore is published in the Aberdeen Journal. The sarcophagus, with its lid, weighed nine tons, and was drawn through Windsor with eight horses. It was formed out of a single block of Aberdeen granite, and was constructed to contain two coffins. Three of the eight workmen employed in the construction of the sarcophagus are still living.

"Effective advertising is the kind that is always fresh and interesting. If there are several things to talk about, talk about one at a time, and talk about it so that it will make an impression. Don't say the same old things over and over in the same old way.

THE ART OF DESIGNING SMALL HOUSES AND COTTAGES.*

BY BARRY PARKER AND RAYMOND UNWIN.

IN no house can every advantage be obtained; each must be somewhat of a compromise; in each there must be a sacrificing of what we deem the less important to secure what we esteem of greater value. It follows that the variety of our attitude must produce individuality in the results.

Suppose we have received a commission for a dwelling house. The first thing is to visit the site and devote some time to thinking out the problem on the spot. The site is the most important factor to be considered, for it usually suggests both the internal arrangement and the external treatment. If the site is a large one the position of the house upon it must first be determined.

A primary consideration must be to place the house as to afford its occupants the greatest possible enjoyment of such beauty of adjacent country or grandeur of distant view as the site can command. While doing this, however, we must so place and design the house that it shall not stand out as a disturbing excrescence, but shall look at home in its place, in harmony with its surroundings.

This consideration of the house as a detail in a larger picture will bring us to a detemination of its general form, its treatment and its colouring. Some positions demand a lofty building to crown or complete a spur of rising ground, for example, while others seem to suggest that it be kept as low as possible, as when it nestles under some protecting hill-side. And in the country at any rate the low house is usually more successful. Some natural terrace may suggest a long house with all its rooms facing one way, or a ridge may indicate a double-faced house commanding the outlook over each slope, or perhaps a steep hillside will require a house following its lines and clinging to it storey by storey, while a gentle slope will demand a general grouping of the roofs to give a sense of stabilty by contradicting it.

In the choice of materials and colouring, harmony rather than strong contrast should be sought. There is only one sure way of obtaining this at all generally, which is of course to keep to local materials and local ways of using them. In some places a low-toned colour-scheme, such as stone walls and grey stone or slate roof, seems most fitting, in others the warmth and brightness of bricks and tiles; some invite the homeliness of whitewash, while others suggest the deep colouring of green or purple slate. Whatever it is, some definite colour-scheme should be adopted and colours of paint and any enrichments made to contribute to it.

Greatly as must the site influence the external treatment of the house, its internal arrangement will be even more definitely dictated by it. The position of each room in relation to the points of the compass and the outlook should be determined on the spot. It is now pretty generally realised that no sacrifice is too great which is necessary to enable us to bring plenty of sunshine into all the main living-rooms. The general rule would seem to be, to so contrive as to get the sunshine into a room at the time when it is likely to be most occupied. Let a study or breakfast-room be east or south-east, a general living-room or drawing-room south and south-west. A good western window in the room we most occupy in the latter part of the day gives us many an extra hour of daylight; while the opportunity it affords us of habitually seeing the bright colour of sunset is a privilege which is worth some effort to obtain. A kitchen is best north-east or east, for the first coming down into the fireless house may well have its cheerlessness reduced by what sunshine is to be had at an early hour; later in the day, when the kitchen is hot with cooking, the heat of the sun should not be added. A bathroom and bedrooms too are pleasant with an eastern aspect, though some cannot sleep in a room into which early sunshine can penetrate.

Next only in importance to such considerations of aspect, and certainly important enough to modify them somewhat, is the question of prospect. For a pleasant outlook is a boon second only to a sunny aspect.

Before leaving the site one should be able to carry away not only detailed notes of drainage, water-supply levels, fine trees, views and aspects, but also a general idea as to the arrangement of the rooms of the new house, an ideal plan to be aimed at, and a sort of mental sketch in block of the general form the new creation should take externally.

It would be only tedious to you if I were to go through all the details of a house, trying to deal with them in a general way. I will therefore take one or two definite examples and explain how and why we worked them out as we did, trusting that the interest which attaches to any active problem solved may come to my aid and redeem the details from tediousness.

We have chosen for the first example a country-house designed for a house in North Saffordshire, partly because the site was not one to very obviously suggest or very imperatively demand a special treatment. The plot of land consists of a small field, long and rather narrow; it is much the shape of a suburban building plot, though situated right in the country (see illustration pages.

The client required the house to have a good comfortable living-room for the general family life; another good room for entering guests and callers; a small den for his own use, with desk, safe, sample cupboards and gun-rack; four bedrooms, one to be a bed-sitting room for an only son; a kitchen with the usual offices; outside there were to be wash-house, stables, coach-house, &c. The house was to be arranged to give as much open-air as possible.

As the site is exposed to the prevailing winds, and the best prospect is in the direction whence they blow, some form of court on to which the rooms might open suggests itself as a means of obtaining the needful shelter. The stable yard not being very suitable for the purpose, the house is grouped round a very small central court, round which a corridor is planned fitted with sliding windows, so that it can be converted at will into a sort of small open-air cloister by sliding the sashes down below the sill. This is roofed over at as low a level as possible to avoid anything of the feeling of a well, which a court as small as this needs must be might soon produce. The main roof also is made to slope away from the court in all directions, so that a good deal of sunlight may find its way in. On to this corridor the main rooms open with wide double doors, and the court being protected against wind on all sides it is possible in any weather, except when extremely cold, to have the living-rooms open to the fresh air to a quite unusual extent. The kitchen, butler's pantry, front and side entrances, and stairs all communicate

* A paper read before the Society of Architects February 7th, 1901. For illustrations, see illustration sheets of this number.

with the corridor, but so as not to destroy the privacy of the living rooms by obliging anyone to pass the doors when going from one to the other. Pleasing vistas are obtained from the rooms across the court, and from the corridor into the rooms, such as it is not often possible to contrive in so small a house. Provision is made in one corner for a ventilating stove to prevent excessive cold draughts in winter.

The living-room, as the most generally occupied, and therefore most important room, is placed at the south corner, having the double outlook to south-east and south-west, and getting all available sunlight and the best of the prospect. It is not enough to give a room windows in the right direction, however : the room must be so arranged that it shall, so to speak, turn its right face, and the windows be so placed that they shall be naturally seen out of from the most usually occupied parts out of the room. For this reason an angle window commanding the best part of the view is thrown out on the south-east side. The fire is put on the north-east wall, and, so that a thorough sense of cosiness may always be obtainable, it is placed in a deep recess or ingle.

Now an ingle affords a very good instance of how easy it is to misuse the old examples which we study, and that in two directions. For while some neglect altogether the suggestions which they offer, others copy the old forms without troubling to understand them. To make use of old features legitimately, of course one must first understand the reasons which called them into being : the difficulties which they were designed to meet ; and when similar reasons or difficulties present themselves to us we may then avail ourselves of the solution which they indicate, not copying slavishly the details, but taking the principle and working it out to suit our own particular circumstances. The ingle, of course, had two main uses : the first was to protect a wide open fire from the cross drafts arising from badly fitting or open doors, shutters and windows ; the second was to afford seats near the fire, sheltered from the draughts, where the aged and feeble could rest or any one could keep warm in cold or rough weather. Incidentally, no doubt, our forefathers appreciated the value of contrast, the charm of the ruddy fire-light space glowing red in the ill-lighted building, and the cosiness of the sheltered low recess in the wide and lofty hall. To obtain this charm, as is often done, by forming an ingle so small that one cannot sit in it comfortably, is merely to remove the fire further from the room ; while on the other hand, to arrange a large ingle, as is also sometimes done, with a modern tiled register stove set in a chimney breast is to lose the feeling of "sitting on the hearth" and the charm that springs from the fire being able to cast its glow all over the recess, and to be seen from every part where one can sit. To adapt the ingle rooms of moderate size then and justify the space it occupies, it must be large enough to be comfortably sat in regularly : a place where one can live, not merely go to be roasted. The fire must be so designed as to have something of the feeling of the old fire on the hearth, and must not be cut off from the recess or in any way allowed to grow into a fireplace within a fireplace. It is generally well to make the whole recess into the hearth, and we often arrange for the fire to burn in a suitably-shaped fire-brick hollow, which answers all purposes excellently. Fenders are best avoided, and anything like a loose coal-box is a disadvantage. A coal-box can generally be contrived in the thickness of the wall. The ingle must of course be protected from cross-draughts, otherwise the fire cannot be sufficiently exposed. When properly arranged and fitted with comfortable low seats, the ingle always proves to be a favorite part of the room : the place where people naturally go to sit and rest.

But I am digressing from the plan, and must return to the living-room which we are designing. There the ingle is of somewhat special construction, having several small windows to afford peeps out towards the court and the view, and to give light conveniently placed for anyone reading ; and also having cupboards for the display of the clients's collection of oriental pottery which is being utilised somewhat by way of decoration, where the changing lights falling on its bright colourings will give some additional variety to its beauty. The ingle is made deep enough for the seats to serve for sofas.

As meals will be taken in this living-room, a small dais for the purpose is provided in full view of the fire ; and, by the client's wish, the recess for this is made a window recess in the form of a large sunny bay, having fixed seats on three sides of the table. This bay gives us another window facing directly to the best view as well as one to the west, which brings the evening light into the room, while the recess is a great advantage, as it prevents the room being blocked up with the meal table.

Near the door a slight recess is formed for a sideboard ; and this end of the room is lighted by a window close by, which opens on to the balcony. A recessed balcony is, in our climate, much more useful than any projecting verandah. It is possible, owing to the extra shelter, to sit in such a balcony two or three times as often as in the verandah with open ends.

In this room all the important furniture forms part of the scheme : it is thought out and designed with the building. In the treatment of the room advantage is taken of the beams and lintels required for the recesses, and where these are lacking a deep picture-rail carrying line with them is adopted, under which the side-board, cabinet and windows are arranged to finish, leaving an unbroken frieze above and giving a sense of order and unity to the whole. This frieze is decorated with a painted suggestion of landscape, but in simpler treatment if whitewashed, or tinted with the ceiling, would be light and satisfactory. The lower portion of the walls, under the decorated frieze, is finished in plaster tinted to the required shade by mixing colouring matter with the skimming coat.

Where economy is any consideration rooms may be kept as low as possible, giving additional space subwards, which is as valuable as space upwards, for an air reservoir, and for all other purposes so much more valuable. The house being described is 9 ft. from floor to floor.

The hall or entering-room being intended for less constant as well as more formal use takes a somewhat simpler form. Placed at the west corner with windows south-west it gets all the sunshine during the afternoon and evening, when it is most occupied. It is placed so as to be immediately accessible from the entrance, and opens on to the balcony with folding doors and window. The fire is placed in an ingle contrived under the stairs and half landing, an arch being used in this case to carry the chimney stack and form the recess. The flue from the fire is brought over on to the arch by means of a copper hood. A little bay partly in the porch lights

this ingle. The porch is also arranged under the stair landing, with a seat for a messenger under the stairs.

Adjacent to the entrance is the small sanctum. Here, again, something is taken off the square room, which, while improving it rather than otherwise by giving a recess, for desk and pigeon holes, enables us to have a small vestibule with cupboard for visitors' hats and cloaks.

Handy to the entrance and to this room is the main coat-cupboard and the lavatory, from which a side door leads to the stable yard, while the butler's pantry completes this north-east side of the little court. Beyond this and behind the living-room, having its fireplace at the back of the living-room fireplace, is placed the kitchen. It occupies the east corner of the house and has its main window to the north-east, the right aspect for a kitchen. There is a small window to the south-east, to light the range and make it a comfortable place for sewing or reading. One corner between fire and and window should always be kept free from doors in a kitchen, so that there may be a place to sit in, and it makes a more comfortable kitchen still where it is possible to collect the doors on one side only. Here an arch-way, closed by a heavy curtain when work is done, leads to the scullery, cellar, larder and back door.

The larder has its window in the back porch to get a north aspect, while thorough ventilation is secured by an opening on the south-east up under the eaves where sun cannot reach it. The cellar was added after the preliminary plans were made, the scullery being re-arranged to receive it. This latter is made to obstruct as little as possible the squint window in the living-room ingle, and at the same time gets a south window, which, as there is no fireplace, is a good aspect for it.

The staircase rises from the corridor, and as it is accessible from all parts without passing the doors of the reception rooms, a back staircase is not needed. Where economy is a consideration the back staircase is one of the first things which may be dispensed with, for it adds little real comfort in proportion to its cost.

The bedroom plan follows pretty closely the ground plan, the bedrooms also leading off a corridor round the inner court. The balcony is repeated on the first floor, and, by reason of the parapet and overhanging eaves, it is even more sheltered than that on the ground floor, and makes it possible in two bedrooms to sleep practically in the open air in almost all weathers. It has special value, too, as an addition to the west room, which is designed for the boys' bedroom and study. Here the bed fits in a deep recess out of the way ; a washstand is contrived in the sill of the window of the same recess, which is slightly bayed to give the needful room, and a curtain may be drawn across, cutting off all the special bedroom appliances, so leaving a good comfortable study.

The central court enables the corridor to have opening windows to three aspects, so that some can be opened whatever the direction of the wind ; it also makes it possible to cut on the bathroom, housemaid's closet, and w.c. by means of a lobby having two little windows on to the court.

Of the treatment of the rooms little need be said. The recesses by the chimney breast are fitted with cupboards and book shelves, which are designed to include simple framings or mantels for the fireplaces ; the cornices are arranged to match the cornice over doors and windows and to carry line with a picture-rail running round the room. Wallpapers or other decorations stop at this rail, all above being taken in with the ceiling. This arrangement enables the ceiling to be broken up with the slopes of the low roofs without giving the ugly odds and ends of papered wall, which really are the only unpleasing feature about a ceiling broken up in that way.

During the whole of the planning the elevations are of course kept in view, and the block design carried away in the mind from the site constantly exerts modifying influence. The difficulty usually is to maintain sufficient simplicity ; so many features are suggested by little conveniences of planning that one has more often to cut them out, not too seek for them merely for the sake of effect.

This plan which we have just considered representing, perhaps, rather a large house to be classed as "small," does not quite illustrate one point to which we attach very great importance in the designing of small houses. The two plans on illustration page show this—in which a special effort was made to obtain one room (the hall) giving some sense of space in a house not large enough to contain several large rooms. In every small house it should, we think, be a first consideration to secure one room large enough to afford some opportunity for interest being worked into the room itself, and to allow some comfort and dignity in the life of its occupants.

In the house shown the hall was made into the chief living-room and carried up two storeys to permit the introduction of an organ gallery. The gallery leading to the balcony, the landing, and the staircase are all thrown into this hall, the stairs being so arranged as to afford a screen to the fire, forming a sort of deep ingle with low ceiling under the landing. The low ceiling continues under the organ gallery and the balcony, the central part of the hall being open to the full height. The sense of cosiness in this ingle is greatly enhanced by contrast with the lofty open space outside, while the variety in lighting—whether when the morning sun streams in at the great east window, or when the ingle glows red in the gathering dusk—adds a perpetual charm. In the gallery is a second fire with a lounge seat by the organ under a kind of canopy formed by the half-landing of the second-floor stair.

To obtain this spacious hall the remainder of the house has been reduced as much as possible. Only one other small room, for den or mealroom, is provided, with kitchens, offices and four bedrooms, two of which are on the second floor. It is open to question whether it would not have been a wiser use of the space to have thrown the vestibule also into the hall as was at first intended. Much dignity would have been added to the entrance thereby, while the way from the kitchens to the bedrooms would have been even less through the living parts of the hall than now.

Lest you should be inclined to think that only for people living a very exceptional life would it be advantageous to throw so much space into one room, I will next refer to a design made for a London literary man, who, though not able to afford a large house, still by reason of his position, required occasionally to be able to entertain a good deal of society. Here the first consideration has been to obtain a hall which would be at once a comfortable living-room and a dignified entertaining room (see illustration pages). The meal-room has been kept as small as would just allow a little dinner party to be given in it. The fire is placed in one corner,

the sidehoard in another ; had it been possible to put the door also in a corner it would have been still more convenient, for in a small dining-room it is in the corners that there is a little space to spare.

The narrow Hampstead building plot, having a southern aspect and the best prospect to the south-east dictated the general arrangement of the house and the placing of the best room at the south-east corner. This room is spanned by two arches to carry the wall of the study over ; within one of them is placed the fire recess with seats and fitment, thus using up all the space under the stairs to add to the size and character of the room, while the stairs themselves, which are shut off from the vestibule by a door, are also open to the room, the quarter-landing forming a small gallery overlooking it.

The staircase is such an essentially interesting and decorative feature in a house that it always seems a pity to shut it off in a mere passage, and the space under and around it may be made to add so much to a room

THE PAN-AMERICAN EXPOSITION.—UNITED STATES GOVERNMENT BUILDING.

both in size and individuality. In old houses the charm of such features is well recognised, for the favourite view, alike for the artist and the photographer, is that which contains some peep of stair from the hall, some gallery, balcony, ingle or deep window recess. When the most is made of such advantages as can be claimed for the bare square room, they seem but a poor compensation for the loss of character and charm.

Over the hall in this house are placed the client's studio and bedroom, the two being so combined that both may have the benefit of the whole air-space, bookcases and curtains screening off the bedroom portion. Double doors and double windows are fitted to this room, for perfect quiet both by day and by night is essential, and further to secure this, ventilation is obtained by means of two fire-places with an air shaft built in one of the stacks.

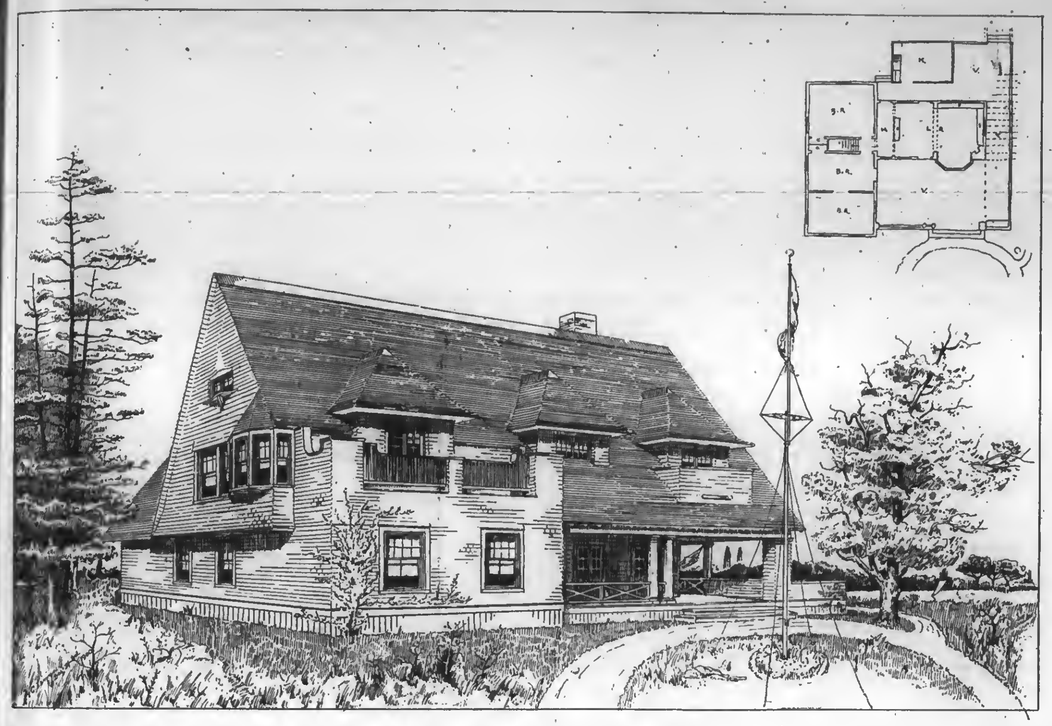
But I must pass on now to cottages, the second part of our subject. I propose to regard as a cottage any house in which separate accommodation is not provided for servants.

To cottages then all that has been said about the advantage of securing a good living-room, even at great sacrifice of other conveniences, applies with additional force. For not only is the total space at our command usually less, but the number of functions which the living room has to provide for is greater, many of the functions of a kitchen being added to it. To combine the comforts of a living-room with the convenience for work of a kitchen will tax our skill in planning, and as the space we can give becomes less our care in the disposal of it must become greater.

Let us again proceed by way of example, taking a rather large cottage designed for a client who wished to live a quiet, simple life, yet on the scale that would allow of his enjoying the more necessary comforts and refinements (see illustration pages). The site is near a small Derbyshire town, and consists of a mound used by the outcrop of some shale grit. The site seemed to demand a simple oblong house with plain open roof kept as low as possible, forming a sort of ridge on the step-sided mound.

The western end of the building naturally becomes the living-room, having plenty of window in the desired direction. There is a window to the north to command the best of the view—not a large one certainly, but one so placed that it is natural to look through it from the outer door, placed there that it may be possible to enjoy the charm which a door opening direct from a room on to a sunny garden always gives. Such a door must, however, be so placed that while the peep out is obtained the comfort of the room is not destroyed. Here we have gathered the two doors and the stair foot together in a narrow part of the room out of the way, leaving all the rest of the space comfortably to occupy. The fire is placed on the north wall, in a deep recess.

To this one good room is added a kitchen for the more dirty work, fitted with a small range, a good cupboard for coats and hats by the entrance, a coal-place and larder. Upstairs are four bed-rooms ; one being rather narrow has a bed-recess taken off the larger room to help it, and as it is over the low ceiling of the ingle it gets the advantage of extra height under the sloping roof, and thus the low ceiling, which adds so much to the feeling of cosiness in an ingle, is made to help the bedroom over. Where some such arrangement as this is not possible, we sometimes utilise the space between the low ceiling and the floor above as a



SUMMER COTTAGE, TORONTO ISLAND.

Designed by Charles Lennox.

storage cupboard, and we often take advantage of it for ventilating purposes, by bringing fresh air into the room, slightly warmed by passing behind the fire, and delivering it over the opening to the recess, where it is distributed with the least possible draught. Where an outlet into a flue is desirable to supplement the exhaust due to the fire, we find this a very good place to arrange it. In a room with close-fitting iron casements, sufficiently well built not to leak excessively through many parts of the room. A window on the south side admits plenty of sun, and in addition on this side there are floors, skirting and door. The most frequent cause of a smoky chimney is the want of sufficient air-supply, and some form of inlet is an absolute necessity. In bedrooms we have successfully arranged this through a hollow fender kerb in some places.

All the bedrooms in this cottage are so arranged as to have a fairly comfortable corner between the fire and a window, where one can sit to read or write. An east aspect is obtained for the bedroom, and a linen cupboard warmed by the cylinder is provided.

Of the elevations I need only say that local random range stone is used for the ground storey, while for the upper portion the need for obtaining four bedrooms over a house so narrow required the use of 9 in. brick walls, which are rough-cast in cement. To avoid the expense of dressed stone, and also to connect the two storeys a little, all the windows have brick jamb and mullions, and the rough-cast is carried down over them. The roof is covered with local stone slate.

Time will not permit me to refer in detail to any smaller cottage plans. But enough has, I hope been said to make it quite clear that, whatever the size of the house, we think it should grow, both as a utilitarian plan and as an artistic creation, out of the real needs of the occupants ; and that the art of designing small houses and cottages consists, not in following any accepted code of conventions, however useful these may be in their place, but in working out such a convenient and comely setting for the special life that shall be lived as shall enable that life to expand itself to the fullest extent, not merely unhampered by the building in which it is clothed, but actually stimulated by a congenial surrounding.

CORROSION OF SOFT STEEL AND WROUGHT IRON.

Mr. F. H. Williams, of Pennsylvania, has recently published the results of some corrosion experiments made with pieces of soft steel containing respectively 0.078, 0.145, and 0.263 per cent. of copper. The steel without copper was found to lose 1.85 per cent. of its weight under the conditions of the experiment, while the pieces containing copper lost only 0.89, 0.75, and 0.74 per cent. in weight. Some experiments with wrought iron showed that the addition of 0.393 per cent. of copper to the iron materially reduced its rate of corrosion. Further information with regard to the effect of the presence of small quantities of copper upon other properties of the iron and steel would be of interest.

Architects, builders and influential citizens in New York City have organized the "Work Together" Club. The object is to promote harmonious relations between employers and employees by bringing about reforms directly affecting the building trades.

The City Building Inspector of Ottawa will conduct an investigation into the cause of the recent collapse of a brick building in course of construction for use as a livery stable. Fortunately only one of the dozen workmen employed on the building when the accident occurred was seriously injured.

BRITISH COLUMBIAN LETTERS.

No. V.

At a recent meeting of the R. I. B. A. the necessity of elevating the standard of public taste in architecture was the theme of a very able paper followed by some brilliant discussions and remarks, the whole leading to no very definite conclusion as to how the education of the Philistines might be improved. The solution of the problem is not hard to find; Philistia could scarcely exist if all architectural work was good, for the public only estimates the comparative merit of work by taking as a standard that which they have been brought up to believe to be good; thus, if the great mass of architecture is bad, or say only indifferent, public taste being formed almost wholly by association is necessarily also but "indifferent bad": therefore, Oh, Architects! by raising your standard of excellence you will surely elevate that of the contemned public.

The applied arts and crafts suffer as greatly from the want of discrimination evinced by the majority of architects as from the neglect and ignorance of the public, and there is no one art so hideously misapplied as that of stained glass. In our report of the First Annual Exhibition of the Arts and Crafts Association of British Columbia reference was made to the excellence of the glass exhibited in this line by Messrs. H. Bloomfield & Sons. In such a report it is quite impossible to deal with each subject at length, neither is it desirable to do so in other than a general manner. Objection has been taken to the writer's definition of stamped and painted glass, but on reconsidering the passage the definition seems to be perfectly correct. It is plainly inferred that a leaded glass window to be in correct taste must be in the nature of a mosaic, the actual construction of which should enter largely into the design, in direct contrast to a painted window of ordinary acceptance, which is thus described by W. Somers Clarke:—"In the painted window we are invited to forget that glass is being used. Shadows are obtained by loading the surface with enamelled colors; the fullest rotundity of modelling is aimed at; the lead and iron so essentially necessary to the safety of the window are concealed with extraordinary skill and ingenuity; the spectator perceives a hole in the wall with a very indifferent picture in it, overdone in the high lights, smoky and unpleasant in its shadows, in no sense decorative. We need concern ourselves no more with painted windows, they are thoroughly false and unworthy of consideration." W. Lewis Day appears to have very similar convictions, but his opinions are expressed in a work of considerable magnitude, whereas W. Somers Clarke was obliged to give expression to his views within the limitations of a paper on stained glass in general read in the space of a few minutes before the Arts and Crafts Exhibition Society. In such cases subtle differences have frequently to be disregarded. There are extreme purists who claim that all stained glass that is not absolutely a mosaic of stained glass and lead is painted glass and condemnable as such, and the high nature of the work produced by members of this school entitles their opinions to respect, even though we cannot admit that their arguments are absolutely sound. It is clear that their work is exercising a very beneficial influence over a large section of designers in Great Britain. This extremely severe school probably owes its existence to the prevalence for so long a period of the "painted windows" trenchantly denounced by W. Somers Clarke and is really a protest against the extravagances so frequently indulged in. A paper transparency stuck on to a window is but slightly more objectionable than many of the kalidescopic horrors one meets with at every turn.

Vancouver possesses in Mr. James Bloomfield an artist in stained glass in the best sense of the term. Thoroughly acquainted with the history aud grammar of his art, imbued with a deep love and reverence for the work of the great early European masters, he has none the less avoided the great danger attendant upon a long and ardent study of ancient methods, for the fascination of this study not unfrequently leads to the conviction that nothing which is not old can be good, thus converting the student into a more or less scholarly reproducer of antiquities. No one believes more completely than does Mr. Bloomfield in modern advantages and opportunities, neither can anyone hold more decidedly than does he that modern work will some day surely equal the old and will also possess noble characteristics distinctive of its own period.

Fourteen years ago while acting as a junior draughtsman in an architect's office in England he turned his attention to wood engraving and discovered his own capacity for decorative design. His removal to this country interrupted the sequence of his studies, but opportunity came to him in the guise of an illuminated address presented by the citizens of New Westminster to the Governor General, the Earl of Aberdeen. His Excellency proved his appreciation of the artistic merits of the address by requesting Mr. Bloomfield to prepare designs for a series of medals for the Boys' Brigade of Canada. His Excellency then made it possible for Mr. Bloomfield to proceed to Chicago where he became junior designer to a firm ranking second only in America to Tiffanys. Here our student attended the Chicago Art Institute, drawing principally from the life, but losing no opportunity of gleaning any knowledge of any and everything connected with decorative design; thence to New Orleans as chief draughtsman to a firm of glass workers, but making time to study at the art schools. Finding his progress here unsatisfactory he proceeded to Europe and pursued his investigations into decorative art all over Flanders; so on to London where he worked at decorative painting principally, but seizing every opportunity of studying at the Polytechnic and South Kensington, drawing, too, continually from the life. During this period of unremitting labor he succeeded in seeing a very great proportion of the famous stained glass in the south of England. Sending some sketches of glass to Manchester, Mr. Bloomfield was immediately offered a position there which he had to decline owing to the necessity of completing certain work he had in hand; however this overture was renewed later and accepted and, if possible, he got down to harder work than ever. He was principally engaged upon church windows, hut worked also upon head and tail pieces for type founders, on decorative painting and heraldry. Finally having prepared designs for the memorial windows to the late Bishop Sillitoe he came out to execute the work and has remained ever since in Vancouver. The coast does not yet afford a designer of such resources many opportunities for the full exercise of his powers, but even in slight and quite inexpensive commissions one finds a character and individuality stamped upon the work that is refreshing. The illustrations, on separate sheet, are from photographs in which the play of light and the color values are of course more or less lost, but the broad vigorous treatment is preserved.

During the past season building operations have been fairly steady, both in Victoria and Vancouver. We believe it has proved a record year for the former. In Vancouver several blocks have been completed, principally on Hastings street, in which few vacant spots are to be found between Granville and Cambie streets. Granville street has also made a solid advance between the Depot and the Hotel. The town is now growing so large, and the site covers such an enormous extent of country, some of it "quite in the country" as a matter of fact, that it is not easy to keep track of all the building. It is principally in the West End that residential work has proceeded during the past season, the southern slope towards English Bay showing to a marked extent the tendency of the people to go farther and farther from the business centre. Probably the most important building of the year is the new Roman Catholic Church, "Our Lady of the Rosary," which possesses a fine peal of eight bells. The vaulting is lath and plaster, the shafts of the columns are scagliola and the geometrical tracery is wooden throughout. In spite of this and the fact that much of the detail is galvanized iron, this church is a great advance upon anything else yet built in the city;—we mean, of course, in ecclesiastical work. It is delightful to once more hear the distant bells, even though the ringing is not yet very scientific. In residential work nothing very notable has been accomplished, the larger work being rather pretentious than interesting. Most of the houses are a very local version of Colonial, which was at best but a wooden imitation of the weakest style that prevailed in English architecture, a period in which it is generally acknowledged that art in general reached the extreme low water mark of English history.

The Arts and Crafts Association of British Columbia held its first annual general meeting on the 4th March; the attendance was somewhat meagre, but the report of the work carried out during the past twelve months was distinctly creditable. His Honor the Lt.-Governor was elected Second Patron and Mr. Harry Abbott, Third Patron; W. J. Ferris, President; Mr. R. B. Ellis and Mr. R. M. Fripp, F.R.I.B.A., vice-presidents; Mr. Q. M. Eveliegh, secretary, with a very good committee, in which pictorial art is perhaps a little too strongly represented. It is to be regretted that the craft as a whole do not appear to recognize the value of the work attempted by the Association.

There are rumors of a Carnegie Free Library, of possible art school and even technical schools; Mr. David Blair, of the newly formed normal school, is inculcating elements of art training into the public school teachers. It really does look as though 1901 is to be the year of inauguration of art education in British Columbia. May it prove to be so.

LANDSCAPE ARCHITECTURE.

By Frederick G. Todd.

It would be mere pretense on my part to attempt to cover the subject of Landscape Architecture in such an article as would be available for your magazine, and I have therefore been obliged to omit almost entirely the interesting history of the profession and much else that I might include, and have confined myself to a general discussion of such problems as are constantly arising.

There are two principal styles of Landscape Architecture, the formal and natural styles. The formal style is much the oldest and perhaps reached its greatest perfection among the Romans, where their stately and costly architecture was echoed and re-echoed by their costly and formal gardens. The early ornamental gardening of England was also of the same courtly and formal style, until through the influence of Repton, Whately, Kent and others a reaction was brought about in favor of the natural style, the enthusiasm for which was so strong that many of the old time formal gardens were swept away. We even find Mr. Kent planting dead trees that the ground might assume a more natural appearance. These men were all true artists, however, and laid the foundation for the rural architecture and gardening, which has been brought to such perfection in England. They gradually came to realize that each style had its own mission to fulfil, that the old Roman style with its terraces and straight walks, its fountains and its statues made a pleasing adjunct to the house, even though the rest of the grounds were treated naturally, with undulating lawns and graceful outline of forest and shrubbery.

Japan Ivy on Piers, Destroying Form and Proportion.

In Canada and the United States it is only within the past twenty-five years that much attention has been given to landscape architecture, and the greater part of the best work has been done by that peer among landscape architects, Frederick Law Olmstead, and his associates. The natural style has been popular almost to the entire exclusion of the formal style, and it is to be regretted that this is so, for there are times and places where it is appropriate and where the effects brought about by the use of clearly defined walks and terraces arranged in formal designs and combined with the use of statuary, sun-dials, garden vases, fountains and kindred embellishments, are such as can be obtained in no other way. Although through the influence of Mr. Olmstead and others much good work has been and is being done, it is still the rule rather than the exception to see costly private residences and public buildings standing bleak and lonely without a tree or a shrub to relieve the hard outline of the architecture; or it may be that some planting has been done, but often such disposition is made of the shrubs and trees as to injure rather than help the appearance of the house, and a place of considerable size made to appear small, mean and uninteresting by the dotting of shrubs, trees, and flower-beds over the lawn.

I wish it were possible to dispel the all too prevalent impression that the beauties of landscape architecture can only be applied to extended acres. Lawns and trees being the two essential elements, some of its beauties may indeed be shown wherever we have a rod of grass, a tree and a few shrubs. In the case of a large expanse of ground fortunately situated, the transformations of landscape architecture may be displayed to their fullest extent—the different views, the variety of scene, the effect of light and shade—all are best obtained with ample grounds, but it is none the less true hat the person who has a small city lot with a scrap of lawn and a chance to plant a tree or two and half a dozen shrubs, may study their arrangement with equal advantage.

In the treatment of a country place the first thing to decide upon is the location of the house. There are no hard and fast rules which can be laid down. Everything must be governed by circumstance and by adaptability to surroundings. Convenience and practicability should generally be considered as of first importance, while the different views to be obtained are of almost equal consideration, and sometimes may even take precedence. It is often pleasing and very effective to place the house so that a beautiful vista may be had through the hall or from some large and important window. I know a view of this kind which would be perfect if seen in this way. The foreground is composed of the lawn, while across a pastoral valley studded with groups of large trees there appears the white spire of a church, rising above the tops of trees which shelter and almost hide the houses clustered about. If this view could have been placed on the axis of a large window in the living room, where it could be seen through all the varying moods of the weather, it would have given a beautiful landscape picture changing with every change of the atmosphere, with every rising and setting of the sun and with every season of the year. The morning rooms of the house, especially the breakfast room, should, if possible, receive the morning sun, and as pleasing views as can be obtained. If the grounds are flat and not very large, more can often be made of a place by locating the house well to one side, for a good sized lawn on even one side of the house is usually much more pleasing than a smaller one on each side of the house. The living front of a house should in every case be kept as far as possible from distracting influences. The drive should never be brought to this front of the house if there is any possible way of avoiding it, and the main walks should preferably be kept to one side.

The locating of the entrance drive is an important feature and the land must be studied with care so that every natural feature can be taken advantage of. A gracefully curving drive is usually most appropriate for a country place, but the curves should not be made without sufficient cause. The meaningless serpentine drives and walks which are sometimes seen wriggling up to a house invariably fill one with disgust. Approaching the house it is very important that the first

view obtained shall be pleasing, for one's first view of a house is often the most lasting. I prefer also, if it can be done without a forced appearance, to confine the approach view to the house and its immediate surroundings. For the house is the natural objective point, and to display a magnificent view just before the house is reached divides the attention and neither receives its full share of appreciation. The view then would better be saved to be enjoyed from the other side of the house.

Bridge and Planting well Combined.

The planting about a house depends almost entirely upon the style of the house, the shape of the land and the general character of the existing vegetation; but generally speaking, there should be a small amount of planting about the house, for trees, shrubs and climbers well arranged serve to augment the beauty of the architecture, and often make a less expensive house look finer than a costlier one, which presents nothing in the heat of summer nor the storm of winter for the eye to rest upon but bare walls and harsh outlines unbroken by vegetation. It is often the case that a few shrubs and climbers judiciously placed will bring into closest harmony a house and grounds which without them would have been at never ending war with one another. Caution should, however, be displayed in the use of such plants as Japanese Ivy, for by covering entirely the angles and ornaments of the house they often defeat the very object for which they were planted by destroying every architectural feature and rendering the whole flat and uninteresting. The remaining planting should in general be confined to the borders of the lawn and if that is already surrounded by trees, the planting should be intermittent, in some places allowing the breadth of the lawn to sweep out of sight underneath the trees, and at others to be stopped by a mass of shrubs, for a large lawn whose every part can be seen from any one point of view is much less interesting than one which may perhaps be smaller, but which is more intricate, which has corners and bays into which it is impossible to see, and which allows the imagination to conceive of all manner of interesting things, just as a painting is often more interesting which leaves much to the imagination. The disposition of trees upon the lawn requires much careful study both as to the kinds to be used and the places they should occupy, for some of the most pleasing results are obtained from the light ands hadow cast upon the lawn by the trees. Especially is this true when in the late afternoon the pointed shadows creep out on the lawn and the yellow sunlight drifts in under the branches of the trees.

It is impossible for me in this short space to say much about flowers, but whatever is done, keep the lawn proper in simple turf; don't cut it up with flower beds; put the flowers in masses in the borders of the shrubbery across the lawn where they will have a good background and arrange them in such a way as to have at all seasons masses of color about the border of the lawn, rather than flowers scattered all about which in themself are insignificant. Plant a few tall-growing flowers, such as the Oriental Poppy and the Golden Glow under the breakfast-window, where they will nod a good morning through the window. As regards shrubs and trees whose deformed branches and unnaturally colored leaves are to some a mark of beauty, I should prefer to omit them altogether, but if they must be used by all means put them in a museum by themselves, where they will not strike a discordant note in

An Artificial Pond, Natural Style.

the landscape, but will really prove interesting as curiosities.

In planning for a country place, whether it be large or small, let every advantage be taken of the natural surroundings. Let the style of the house and its surroundings conform to it as much as is practical. Take advantage of a steep bluff, a large tree, or a magnificent view in locating the house, and keep the lawn on the living front of the house quiet and reposeful, unless it may happen that the style of the house and its location demand a picturesque treatment.

The arrangement of the ground about a house built on an averaged sized city lot is an entirely different problem than is encountered in the country estate. There is usually little choice as to the location of the house and it is generally best for the sake of the appearance of the street to have the house front on line with the rest of the houses. This is not always the case, however, for there are times when a slight change in the location may enable us to have a small garden or some other attractive feature. I think that it is even advisable at times to put the house directly on the street and leave all the space at the rear with the best rooms looking out upon it, but such a location would not be made without fully considering the surroundings both present and prospective. It is a great mistake to think of the ground back of the house as wasted or as merely a storage place for ash barrels, etc. These and other similar necessities can be kept in a neat corner by themselves, hidden from view by masses of shrubbery. The remainder of the ground can often be made charming by laying it out formally as a garden or by keeping it as a simple shrub bordered lawn. Shut off from the street by the house it is sometimes possible to obtain in a thickly settled district a private garden or green almost as secluded from the gaze of passers by as if it were in the country. Where planting is done at all there seems to be a tendency at present to over-plant small places. A sort of ruffle of shrubbery is planted around the base of the house, entirely concealing the foundation and giving it a very weak appearance. Contrast with this a house with just enough shrubs and creepers planted about its base to give it a comfortable look of being united to the lawn, and yet with plenty of foundation left to view to show its solidity and strength of character. The best effect is usually obtained by planting the shrubs about the angles of the house and about the front entrance. Climbers almost always add greatly to the appearance and cosiness of a house, and should be freely used about the verandahs. In the various styles of architecture which make use of strong horizontal lines, it is often very effective to train a dark leaved creeper along those lines to further accentuate them, but not to conceal them. A hedge along the street line, or better yet if there is room, an irregular border of shrubs, often increases the privacy of a place and is much pleasanter to look upon than the customary street fence.

In acquiring land for public parks such should be chosen as will best meet the requirements of the city and which will do the most good to the greatest number of people. Usually land which is partially wooded and which has access to water would be the first choice. Both in acquiring the land and in its treatment afterwards it must be constantly borne in mind by those in charge that they are the trustees of lands and funds whose dispositions will have the greatest influence on the future health and morals of the city. If, as is usually the case with parks, it is the intention to do only a certain amount of work each year, nothing should be done until a working plan has been prepared for the whole park. Then the work can be proceeded with as fast or slow as desirable, but above all things avoid spending money for park improvements, which are conducted in a "piece meal" "hand to mouth" way. The result is sure to be costly; it will probably be inharmonious and will lack that breadth of conception which should come from a plan which is the result of mature consideration. The woods should always be preserved as nearly as possible in their natural condition and as a general rule I would avoid using foreign plants to any large extent. It is hardly necessary to add that flower beds would be entirely out of place in any part of a natural park except possibly in the vicinity of a building. If part of the land is covered with a dense wood it should be kept so, and it is a great mistake to try to change the character of a wood by planting small pines under the oaks or vice versa. It oftens happens that there are pine woods and oak woods in the same park and if so, all the better, but this is no excuse for spotting pines all through the oaks. In the same way if part of the park is pastoral with broad meadows of spreading trees, keep it so, or if part is what we might term, like the English park, with noble oak trees scattered about, nothing could be grander. There are cases where it is advisable to change such existing conditions but they are very rare.

In building roads through a park they should be as few and inconspicuous as possible and in all operations, whether it be the building of bridges, shelters, walks or anything whatsoever, let the park scenery be kept as natural and as restful as possible, remembering that such scenery gives us the greatest relief from the noisy confusion and worry of the city and that on this relief, not only our comfort depends, but also our ability to maintain a temperate, good-natured and healthy state of mind.

Montreal, April 3rd, 1901.

A NEW IDEA IN HEATING.

A new method of heating was recently shown in operation at the offices of the Patent Heating, Skirting, and Ventilating Company, Gordon street, Glasgow. The method is to introduce into a room, instead of the ordinary wood skirting, a skirting made of metal. Externally this skirting is like the ordinary wood skirting, of a design to conform with the appearance of the rest of the room, but internally it is divided into spaces through which a heating medium—steam or hot water—circulates. The heat emanating from it is distributed over the room, by means of both radiation and conduction, and the conduction to the floor and walls starts at the place where it is most required—namely, at the junction of the walls and floor. It is claimed for the method that it does not encroach on the floor space, can be applied to any design of skirting, can easily be fitted into existing buildings, and is cheaper, cleaner, more sanitary, and more reliable in action than any other methods of heating.

The Board of Directors of the Toronto Industrial Exhibition Association have appointed the following architects to prepare plans and specifications for the buildings proposed to be erected this year, namely: Manufacturers' building, Gouinlock & Baker; art gallery, Beaumont Jarvis; dairy building, Gregg & Gregg.

As a general proposition, advertising pays. There are qualifying considerations. It must be good.—Advisor.

MODERN CITY MAKING.*

By Albert E. Kelsey.

Modern city-making, speaking in a general way, involves, first, circulation; second, hygiene; and third, beauty. I shall discuss the first two briefly, and, while considering the third, will revert now and again back to the first two, to show the inevitable interdependence of all three.

Circulation represents the anatomy of a city, the transit facilities above, below, and on the surface of the ground, the life arteries, or pipe galleries for the distribution of the public utilities and a sewage system.

Here we see the interdependence of circulation and hygiene.

Hygiene represents the aspect and prospect of the city, its general salubrity, the density of population, the lighting by night and day, a good circulation of air, and, lastly, a proper density of construction.

A fixed ratio should exist between the voids and solids of all quarters of the city, whether it be the lofty office building quarter, or the two or three storey modest residence quarter. By this I mean a proper ratio between blocks of buildings on the one hand, and the streets, courts and open spaces surrounding them on the other. If a sufficiency of open space is provided, beauty is possible, and, here, already, we see the interdependence existing between circulation, hygiene and beauty.

Beauty in modern city-making represents the expression of a city. Cities, like individuals have natural and artificial expressions. The dominating chimneys of the manufacturing town, like the surmounting domes and minarets of the Oriental city, each represent their natural expressions.

In the savage age, men had the same organs they now possess, but they were undeveloped. The savage man was unkempt, shaggy and often dirty.

The natural city is unkempt, that is to say it is a haphazard accretion, and it is usually dirty. But, as these cities develop, whether it be the crude manufacturing town, or the mysterious Oriental city, in this age, they soon produce one or more rosmopolitan thoroughfares, providing easy circulation, good hygienic properties, and possibly, some degree of beauty.

The savage city begins to wash itself. It may be but Pera street of Stamboul— but a "lick and a promise,"—yet it illustrates the fact that all cities have certain requirements in common when they begin to groom themselves, and enter into the competition of the world.

This social adjustment may take away much of the picturesque charm and some of the individuallity of a city, but it returns convenience and a state of well being which more than compensates.

The difficulty now confronting the cities on this side of the Atlantic is not so bad as those that existed in the feudal towns of Europe, and still exists in the semi-barbarous centres of the Orient.

We live under a form of goverament, however, which is not as hospitable to swceping reforms as their's are, and, as it is our ostensible policy to expend public funds for the benefit of the greatest numbers, we should then work for raising the general standard of the entire city rather than the mere improvement and embellishment of spots.

And yet a beginning must be made and, of course, in some spot.

That very acute art critic, Charles Elliot Norton, of Harvard, long since pointed out the necessity of building up a general art appreciation among a people if far-reaching results were to be logically produced, and he suggested object lessons as more potent educational factors than any amount of preaching.

The thought that this work could be entrusted to the coming generation, and that the young at school and at college should be prepared for it by being surrounded by beautiful buildings which should appeal to them unconsciously, and infuse in them a constant desire for the beautiful.

Let me carry this idea further.

If we are to metamorphose our cities bodily, why not seize upon this idea as a popular scheme, and apply it to all the new public school buildings, one by one as they are erected, a scheme that would meet as few conflicting rivalries as any, and one in which nearly every parent would take an interest—an eminently democratic scheme, a scheme which, once set in motion would gradually improve every quarter in turn, thus creating new centres throughout a city's area, around which property would always be improving. And, lastly, it would gradually raise the standard of the entire city, without involving any great expenditure in any one spot. Furthermore, it would set in motion a system of continuous rotation that might be applied to many other public and semi-public institutions in any community, and, as an object lesson, it would always be teaching the lesson of continuity and interdependence, the first principle of modern city-making.

Let us try to envisage our own marvellous times with accuracy as well as with beauty.

To do it we must be alert to feel that pulse of the people, and if we feel keenly, perhaps some may understand clearly enough to record our history with trustworthy thoroughness.

It is certain we can better make our structures represent these, the only times we have known—this, the only era we have lived in—than any past history, no matter how glorious. Beware of Archaeology!

Spontaneity in architecture must spring from a natural every-day impulse. Living architecture must appeal to the beholder and lead the mind forward. It must be progressively anecdotal to stimulate the imagination and to rivet attention.

Let us then try to see things as they are; let us appreciate the scope and universality of modern life; let us grasp the spirit of the times and then build unaffectedly.

To give direction to public sentiment your society can do much. It may agitate through the daily press such improvements as may be popularly deemed necessary, and by taking such an active part you will soon be surprised to find that as matters are shaping themselves artistically your advice will be more and more respected and followed.

However remote or however small these beginnings may be, remember whatever you plan to lay out, construct or re-construct, that it is an integral part of the entire city, not a scattered unit, but one of a system of units.

See to it that only the best talent is employed, and that the design itself is made indigenous in spirit and modern in construction, always remembering that the great on-sweep of the world is weaving itself into the fabric of all great cities, teaching us—not independence—but the interdependence of man.

* From a lecture delivered under the auspices of the Toronto Architectural Eighteen Club at the galleries of the Ontario Society of Artists, Toronto, Feb. 5th, 1901.

HISTORY OF THE ONTARIO ASSOCIATION OF ARCHITECTS.*

In the summer of 1887 some of the architects of Toronto agreed to meet together once a month to dine and talk over matters of professional interest. At the fourth dinner this Club, which by then consisted of twenty-four members, assumed a Constitution and a name, calling itself the Architectural Guild of Toronto.

The Guild soon became so active that when in the following summer the Minister of Education for Ontario, the Hon. G. W. Ross, wished to establish a Chair of Architecture at the School of Practical Science in Toronto, he invited the advice and co-operation of the Guild. A Committee of the Guild met the Minister at his office on October 29th. In the conversation which then took place was suggested the advisability of the architects of the Province of Ontario becoming incorporated as a Society or Association with power to examine and license persons wishing to practice Architecture in the Province.

At the monthly dinner of the Guild held on November 8th, 1888, the idea was put into action by the appointment of a Committee to draw up a scheme for the formation of an Association which would be the first step to the attainment of such incorporation.

The Committee consisting of the following members of the Guild,—Messrs. E. Burke, S. G. Curry, Frank Darling, D. B. Dick, A. R. Dension, H. B. Gordon, Henry Langley, W. A. Langton, E. J. Lennox, Wm. G. Storm, Walter R. Strickland, and S. H. Townsend, reported finally on the 14th March, 1889.

On the 21st March, 1889, in response to an invitation from the Guild, sixty-two architects practising in the Province of Ontario met at the Queen's Hotel, Toronto, and agreed to the formation of an Association according to the plan proposed, passing at the same meeting a Constitution and By-laws and electing officers as recorded in the minutes of that meeting.

At the instance of this Association a bill was brought before the Ontario Legislature, in the session of 1890, by which bill it was proposed that the use of the title "Architect" should be restricted to members of the Association and that, after a certain date sufficiently distant to allow a reasonable time for all architects then practicing to enroll themselves as members, admission to the Association should be governed by examination. The intention was to allow all persons who were making use of the title Architect at the time the Act became law to continue their practice undisturbed, but to require all future aspirants to the title to so qualify themselves, under the necessity of passing examinations in order to acquire this distinction, that the standard of professional attainment in the Province would in the course of not many years be raised; and a finer quality of work, higher aims and a better style of practice prevail as the the natural accompaniment of higher professional training.

It was a good scheme for a new country. In an older country the ancient buildings form standards of comparison beside which faults in modern design can be seen to be faults, so that every old building is a silent tutor of the public taste. But we have no such buildings. The public are led by the profession and the state of affairs gives rise to but little pressure to impel young architects to acquire such training in design as is necessary for the advancement of architecture in this country.

To legislators the measure appealed only as a provision for the safety of the public and they thought this would be sufficiently provided for by giving a distinguishing title, different from the usual title, to architects who had passed the qualifying examinations of the Association; thus setting members of the Association apart as a special class of qualified architects. The bill was accordingly amended in committee so as to make the distinguishing title of members of the Association not "Architect," as desired, but "Registered Architect," and in this form it was assented to on April 7th, 1890. The effect of this change was to kill the movement as conceived—as a universal movement towards the advancement of architecture—and to leave the Association with a struggle before it to attain even the partial effectiveness of a voluntary and partial Association. It proved to be impossible to elevate an arbitrary title over the accepted title; or in other words to degrade the title Architect by law without there being any other reason for its degradation.

If the charter members of the Association had been forced to pass a stiff examination, so that the legal title had from the start a real significance, the result might have been different; but as all practicing architects were of necessity admitted to the Association in order that no vested interests might be injured, the select character proposed for the Association had no real existence, nor could it have any real existence until the ten or fifteen years should pass which were necessary to bring about the retirement of the older charter members and an influx into the Association of young men who had won their membership by fitting themselves to pass the entrance examination of the Association. But this period was a longer time than the Association could be held together to no immediate purpose. The Act was for all practical purposes, in its first years, merely a law licensing practising architects to call themselves Registered Architects. As such it had no influence with the public, and thus the only inducement that the general body of the profession had to support the title and the Association was gone; indeed the most ardent workers for the advancement of Architecture had an objection to the title and did not use it, though they continued to support the Association in its aims and in the work which it still tried to carry on in the way of regulating competitions, testing material, procuring good building and fire by-laws and other public and professional matters, as well as meetings of members for mutual improvement, and annual examinations for students.

After the first year students came forward in very small numbers for examination; so that there seemed to be no hope of establishing even the select body of qualified men that the Act, as passed, was fitted to provide for. But, even if it could be established, a small select body would be of little use as a provision for the public safety. A select body is unnecessary for the sort of public safety which was aimed at by legislators—that is to say to secure the appointment of a competent architect for the construction of great works. Great works are never put into the hands of any but architects of known experience, and the public will select an architect for such works from the elite of the profession, whether they are marked off by an Association or not. On the other hand, for the sort of public safety that can be provided for by act of Parliament, a select body is insufficient, for it is in the diffusion of architectural training that Parliament can best help public safety, by making ordinary building throughout the Province both safe and sanitary; and it can thus help also another matter of practical im-

* Reprinted from Vol. I. of the Proceedings of the Association.

portance to the public, (which is not sufficiently regarded in considering this question,) the return of proper value for money invested in building.

For this reason the Association still hoped to get the more comprehensive measure from the Legislature and made three efforts to obtain it; nor was the opposition they met with such as to give them reason to suppose that there is any real objection to it or that, if it could have been brought to a third reading it would not have received the support of a majority of both sides of the House.

A bill to amend the Act, by making "Architect" instead of "Registered Architect" the exclusive title of members of the Association, was first introduced in 1893, but too late in the session, and was therefore withdrawn.

In 1896 it was again introduced and referred to a committee by whom it was reported to the House, but only on condition that it be then withdrawn. This attempt served as an introduction so that, in the following year, the Bill received support both outside and inside the Legislature; indeed its supporters in the Legislature, who were drawn from both sides of the House, agreed in assuring the Association that there was a palpable majority in favor of acceptance. But the same committee was appointed to deal with the Bill, and this time they dismissed it finally.

The arguments by which the Bill was opposed were in all cases the argument of interests which feared injury. There seemed to members of the Association, who represented the Association in the matter, no cause for the anxiety thus manifested by opponents, but they felt that their arguments in reply failed to carry conviction because they were regarded as ex parte. It seemed impossible for any one to grasp the idea that architects in urging a Bill to improve architecture could be thinking of anything but their own immediate advantage.

The objection raised by Mr. Norman Shaw and others in England—that no amount of examination can produce in a student a faculty of design—was not raised here; but it is impossible to conclude the subject without noticing this protest, raised in the remarkable volume edited by Mr. Norman Shaw, "Architecture a Profession or an Art;" remarkable as being so ably written and yet founded on so palpable a fallacy. It is not contended that examination, or to speak more exactly the education which is called forth by the necessity of examination, can implant in any one the faculty of design; but where there is nevertheless the purpose to design, what little faculty there is may be much developed by study under guidance, and scholarship may serve at least to prevent aberration of taste. It is precisely for this order of designers, and for those who would not otherwise know that there is such a thing as scholarship in design, that a compulsory Education Act would have been useful in this Province.

It is in levelling up all parts of the profession that it would do its chief work; saving us at least from ignorance that does not know that there is knowledge, and helping toward the ideal condition that not only great works but the ordinary types of building should be carried out in a sensible and agreeable manner. As for budding genius—it wants training like any other order of mind to enable it to work to the best advantage; and if there is a doctrinaire position in the whole controversy it is that of those persons who think that knowledge is the death of intuition.

With the failure of its last effort for comprehensive registration the Association became a voluntary Association in purpose, as before it had been in fact, and is now trying to uphold the standard of education in students and of practice in its members by classes and examinations for students and by monthly meetings of members for reading and discussing papers. By an arrangement with the School of Practical Science, students of the Association are able to attend classes of the School for instruction in theoretical subjects; and a studio for instruction in design under the supervision of a committee of the Association is held in the Rooms of the Association at 94 King Street West, Toronto.

These rooms, the latest departure, will without doubt contribute greatly to the usefulness of the Association, giving it such facilities and comfort in work as make work more easily carried on in a continuous way.

The proceedings of the Association will henceforth be printed in a form suitable for preservation and reference; instead of, as hitherto, only as a report in the CANADIAN ARCHITECT AND BUILDER. It has been thought fit, by the Editing Committee to preface the first volume by an account of the origin of the Association and the purpose it at first set before itself of obtaining universal registration of Architects in the Province as the best means of furthering the advancement of architecture which it is now endeavoring to promote by the methods of the voluntary Association.

W. A. LANGTON.

ONTARIO ASSOCIATION OF ARCHITECTS.

The first volume of proceedings of the Ontario Association of Architects printed in pamphlet form has just been published. It comprises seventy-five pages. In addition to the proceedings of the annual convention, it contains a list of the presidents and other officers and committees of the Association; the names and addresses of the members in good standing, a list of the books in the Association library, a brief history of the Association by Mr. W. A. Langton, and views of the Association rooms. The proceedings were published for the association by the publishers of the CANADIAN ARCHITECT AND BUILDER, under the direction of the Editing Committee: Messrs. M. B. Aylsworth, (chairman), E. S. Baker, F.R.I.B.A., W. A. Langton, C. H. C. Wright, R. J. Edwards.

The Association suggested to the City Council of Toronto recently that a plan of the best possible arrangement of wharves, squares, promenades, glass plots, and trees on the water front be prepared, and that the class and location of buildings to be erected thereon be regulated by by-law. By these means the work of improving the city water front would be greatly simplified, and whatever works may be undertaken, year by year, would form part of a well-considered general scheme.

Mr. Frank Darting, architect, of Toronto, has been commissioned to prepare the design for the soldier's monument to be erected in Victoria Square, Portland street, to the members of Imperial regiments who died while on service in Canada.

Negotiations are in progress for the transfer to the Dominion Government of the Plains of Abraham at Quebec, for the sum of $80,000. It is to be hoped that the result of these negotiations will be the preservation for all time of this historic battle ground.

The unveiling of a monument to Laura Secord will take place on June 22nd, and will be the occasion of a military display. The monument takes the form of a life size bust of Laura Secord, modelled by Miss Mildred Peel and cast in bronze. It will be mounted on a granite pedestal bearing a suitable inscription.

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Contributions of value to the persons in whose interest this journal is published are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

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PROPOSED NEW BUILDING REGULATIONS.

The Fire and Light Committee of the Toronto City Council have approved of the following recommendations of the Federated Council of Building Trades: That when buildings under construction reach one storey in height the joists shall be covered or floored temporarily with one-inch boards, as each storey is built. In case of steel structures, where girders are 12 feet centres, two-inch plank shall be used with sufficient support in the centre. Where joists are over 16 inches and up to 48-inch centres ½-inch plank shall be used, and where six-foot centres, 2-inch plank. In builders' scaffolds the distance between standards shall be eight feet instead of eight or ten, as formerly allowable. Where trestles are used the height is to be five feet and the material substantial. When scaffolding is formed by putting trestles one upon another, not more than two trestles shall be used, each five feet high. Above the height of ten feet standard-ledger or ropes shall be used. A guard-rail shall be built around the scaffold to prevent bricks falling, and another guard three feet above the scaffold to keep men from falling off.

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STUDENTS' DEPARTMENT.

METHODS OF THE ECOLE DES BEAUX ARTS.

The statement was made in the Montreal Correspondence in our March number that Mr. J. O. Marchand, of Montreal, was the only Canadian student of architecture at the Ecole des Beaux Arts in Paris. This is incorrect. In December last Mr. A. H. Chapman, formerly a student in the office of Messrs. Burke & Horwood, Toronto, went to Paris and entered upon a course of study in architecture at the school. Through the courtesy of Messrs. Burke & Horwood we are permitted to reproduce from one of Mr. Chapman's recent letters the following description of the methods of instruction employed at this celebrated institution :

"I am thoroughly in love with the system, and I do not think a better one could be followed, for the first part of it anyway. In getting into the school the architectural subject counts for most, then the drawing, mathematics, modelling, and lastly history. It is necessary, however, to get a pass mark in all the subjects.

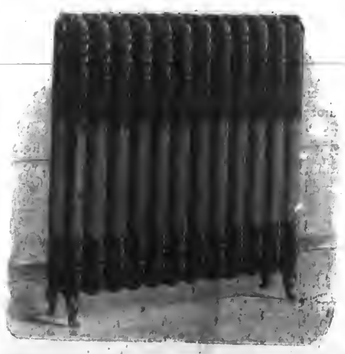
The architectural consists in a design on a given subject made under the surveillance of the Ecole officials, and in the limited time of twelve hours. The drawings generally consist of plan, elevation, and section done in pencil and rendered with a wash, for which it is necessary to work out the shadows. The drawing of this design is usually clear, distinct, and, although there is not time to do very careful work in the detail, it is cleverly indicated, and all that is drawn is correct, and all that is wanted on such a small scale (usually about ¼ in. to foot.) This practice of doing the sketches quickly teaches us to be decisive, and to look to the essence of the design. The designs also are rather strictly classical, which is very good, as the study consequently resolves itself into composing, not creating, as a beginner cannot very well create until his senses are trained to the proportion of forms and to the meaning of detail.

For the drawing examination a charcoal drawing from a cast is required, for which eight hours is allowed. This is usually well executed, correct in proportion, line and values in shading. In this also we learn to pick out the essence and get that right. Both these subjects train the senses, and discipline the mind, without in the least cramping the imagination, except perhaps the danger of a student seeing so many strong men believing in a certain style, being afraid to be original, but even that danger is practically done away with, as the work the seniors do in many cases is as original and free as possible. When the students enter the school in the second-class work they still keep on classical lines, but in the first-class concours they are unlimited. Occasionally at the school they have what we call an "esquisse esquisse" which consists of a design worked out at the school in limited time, generally twelve hours, and I do not know if I told you that in all concours the "partie", which means the idea of the design, has to be worked out at school in a limited time and left there ; so that when the judgment is given, the judges have a sketch showing the student's power of conceiving an idea, and a drawing showing his ability in carrying it out.

The examination in mathematics consists in the usual higher mathematics, and that of modelling and history are unimportant and very easy.

The Toronto Architectural Eighteen Club have fitted up their rooms in connection with the Central Ontario School of Art for the use of students. Classes are meeting regularly and work in design is being proceeded with on the lines prescribed by the Educational Committee.

Hamilton Radiators



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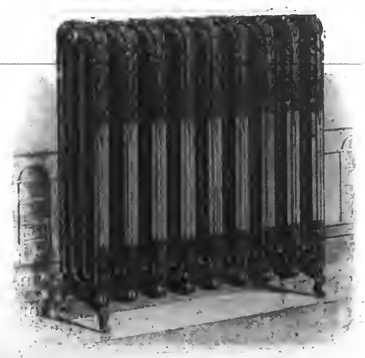

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CATALOGUE FOR THE ASKING

CAUSES OF VARNISHING FAILURES.

Newly manufactured varnish often produces a grainy or spotted appearance. The only remedy is to refrain from using such varnish. It must also be noted that the skin which forms on varnish when it is stored in imperfectly closed vessels may also produce the above-mentioned effect, as may pumice dust on the work, or dust collected from the varnish by the air.

Sweating, which principally happens with good fat varnishes, can be prevented by allowing the smoothed surface to dry for a few hours, so that it may sweat before the varnish is applied, and then give it another touch up with pumice. The varnish is apt to creep if there are oily patches on the surface or if it has been touched with wet hands ; but the same effect may be produced by want of skill on the part of the varnisher, as when folds of varnish appear at the edges.

A varnish may often appear like pressed leather, or as if enamelled, if it has been applied in too cold an atmosphere, i.e., below about 70° Fahr. A stripy appearance may also be caused by improper mixing with turpentine, or by too much working with the brush.

Pin holes and pits are produced chiefly by working in too damp an atmosphere, so that the remedy is easily seen. The sinking in of varnish is generally due to faulty preparation of the surface. The color must have a smooth surface to enable the varnish to combine strongly with it. Another cause is found when wood which is not thoroughly dry is varnished. It is a good plan to pour out the varnish an hour before it has to be used, so that gases in it may escape and not make the coats dull.

Varnish flakes off when applied to unsuitable ground, or when the latter is varnished damp. The same thing may happen if the pigment had been applied too thick, or if it is not quite dry when the varnish is laid over it. Too much dilution with oil of turpentine may also cause varnish to crack off.

The appearance of cloudiness or smokiness in a coat of varnish is the result of atmospheric influences during drying. The room must be freely ventilated to make the drying as rapid as possible. A sojourn in damp rooms is apt to give varnish a blue or green color.

Spots left where mud has adhered and been washed off, naturally seen much on carriages, gradually disappear with repeated washing. Varnish blisters either from heat, or on account of the presence of oil under the varnish. The effect of leather and elbow grease in heightening the lustre of a varnish is too well known to require more than a passing allusion.

After hearing the evidence in the action for alleged attempted blackmail brought by Mr. Joseph Wright against Mr. Joseph Sherlock, of Toronto, Judge McDougall decided that from the legal standpoint no threats had been made, and accordingly withdrew the case from the jury. The action arose out of some remarks made by Mr. Sherlock relating to the character of the plumbing work done by the plaintiff in the new municipal buildings, Toronto, for which work the defendant was an unsuccessful tenderer.

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The Royal Institute of British Architects, desiring to give facilities for those in the Colonies, to qualify by Examination for Associateship in the R. I. B. A., have decided to hold an Examination from June 21st to 27th, 1901, in Montreal. Applications, Fees, and Probationary work must reach London not later than May 5th, 1901. Intending candidates, who must be over 25 years of age, can obtain application forms and copies of the previous examinations on application to

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NOTE.—Those who are members of recognized architectural associations who have passed the regular final examinations appointed by such associations, are exempted from submitting probationary work, but evidence of passing such examination must be given.

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THE USE OF THE GASOLINE TORCH AND FIRE INSURANCE.

So many serious fires have been caused by the careless handling of the gasoline torch within the past few years, says the Painters' Magazine that the underwriters have become alarmed, and have added a new clause to the policies of fire insurance, forbidding the use of this torch for burning off paint, even though it may be a universal trade custom. Even under the old form of policies it is a question whether the insurance companies can be made to pay for any loss caused by one of these torches, unless special permission to use them is endorsed on the policy. It is therefore wise for any painter who is called upon to do a job of burning off to state the matter very clearly to his customer, and to throw the responsibility entirely upon the property owner, giving him an opportunity to consult his insurance agent before the use of the torch is begun. Unless this action is taken, the painter may find himself in the very unpleasant predicament of being responsible for damages either to the insurance company or to the property owners, for even the plea of trade custom could not be made to hold in any court against a claim for damages resulting from fire caused by a paint burner in the hands of a careless employee. It is better even to lose a job than to be mulcted in damages to such an amount as might sweep away the savings of a lifetime. While the old-fashioned charcoal burner is not so effective as the modern gasoline torch, it is not nearly so dangerous, and when the matter is explained to the property owner, he would doubtless prefer to pay the extra cost of burning off by means of the charcoal burner rather than run the risk of the more rapid but far more dangerous method. As we understand it, the insurance companies object only to the use of gasoline, or naphtha, since the tongue of flame of the gasoline burner is so apt to find an entrance into minute cracks and to set fire to the tarred paper that is used between the inner and outer skin of the modern frame building, and thereby cause a fire that will have most disastrous consequences. It would be well, however, for the property owner to have the opinion of the insurance agent who has written the policies in each particular case, before a painter undertakes to execute any contract for burning off paint.

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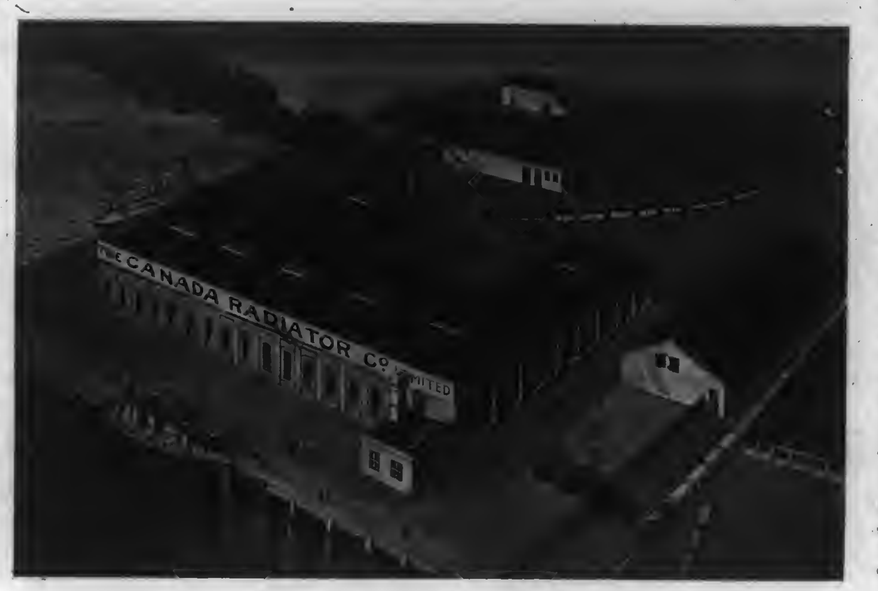

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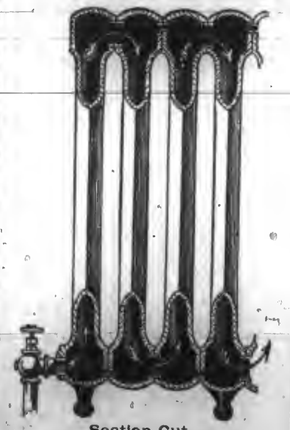

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TWENTY-SECOND ANNUAL EXHIBITION OF THE ROYAL CANADIAN ACADEMY OF ARTS.

This exhibition, which is now being held in the Gallery of the Ontario Society of Artists, King St. West, Toronto, is one of the best representative exhibitions held by Canadian painters that we have had the pleasure of seeing. It embraces the work of nearly all the members, and from this collection we believe will be chosen the works to represent Canadian art at the Pan-American Exhibition. Many of the pictures are old friends, especially those by local painters. The eastern artists, however, add to the interest and enjoyment of the Exhibition. We have two excellent portraits by R. Harris, the president of the Academy, and also one particularly charming thing, "The Banjo Boy." The "Landscape" by Mr. Brymner is forcible and masterly. We have two pictnres from the brush of Horatio Walker, now residing in New York, one of which is a perfect little gem and a rare treat. Another large picture, "The Bathers" by Blair Bruce, residing in Paris, France, is breezy, clever and decorative. Miss Florence Carlyle contributes an interior called "Golden Rod, from the standpoint of light and color an admirable little bit. Homer Watson is ably represented, rich in color, gem-like in quality, but evidently influenced by the old Constable school. A little canvass by St. Charles entitled "Red Man" is a daring and exceedingly clever little piece of technique.

John Hammond, of Montreal, contributes one of his misty dawns, always poetic and sweet, and Maurice Cullen one of his sunny pastorals. In water colors we have two excellent things by Wm. Brymner, of Montreal, and one by a deceased member, Charles Moss, whose removal is most deeply mourned, as he was really one of the most promising young academicians.

Space does not permit of dealing with this matter but summarily. We therefore take the liberty of drawing attention to merely a few of the contributors from the eastern provinces who are not so frequently seen in Toronto. Our local members have been commented on in the past, and are old and highly esteemed friends.

We are glad to announce that Mr. Dyonnet has been elected a member of the Royal Canadian Academy.

NEW CONTRACTING FIRM.

Mr. T. W. Horn, President of the Luxfer Prism Company, has recently formed a partnership with Mr. William A. Illsley, contractor, of Chicago. Mr. Illsley has had an extensive experience in the construction of large buildings in Chicago. The new firm have been awarded the contract for the large hotel to be erected on King street east, Toronto. The contract price is understood to be about $800,000.

NOTES.

A Rochester despatch states that all the stone quarries in western New York producing the famous Medina block paving stones are to be formed into a trust, with a capital of $1,500,000.

A charter has been granted to the Dominion Portland Cement Co., of Wiarton, Ont., capital $250,000, to manufacture Portland cement, bricks, tiles, etc. The provisional directors include David Porter, D. M. Jermyn, both of Wiarton, and John Rowland, Walkerton, Ont.

If mortar is intended for pointing brickwork, a light coloured mortar is composed of lime, putty, yellow ochre, silver sand and copperas, the proportions being regulated according to the desired shade. If the mortar is intended for external plasterwork, a yellow tint is obtained by an admixture of yellow ochre, or yellow oxide, with the material used for the setting coat. A durable yellow tint is also obtained by using a bright yellow sand.

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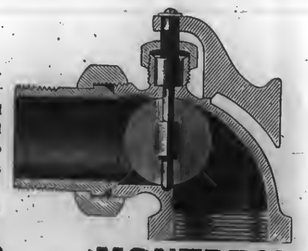

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SUPPLEMENT TO CANADIAN ARCHITECT AND BUILDER APRIL, 1901.

STATUARY FOR THE PAN-AMERICAN EXHIBITION BUILDINGS.

CANADIAN ARCHITECT AND BUILDER.

SUPPLEMENT TO CANADIAN ARCHITECT AND BUILDER APRIL, 1901.

FAN LIGHT ABOVE FRENCH CASEMENTS.

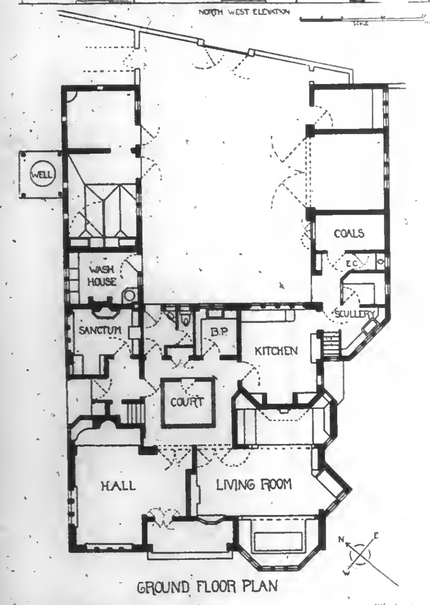
VESTIBULE WINDOW.

HALL WINDOW.

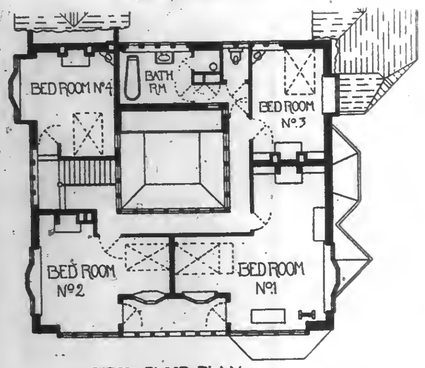
ROSSLAND COURT HOUSE, B.C.

STAINED GLASS DESIGNED AND EXECUTED BY HENRY BLOOMFIELD & SON, VANCOUVER, B.C.

(FOR REFERENCE SEE BRITISH COLUMBIA LETTER IN THIS NUMBER).

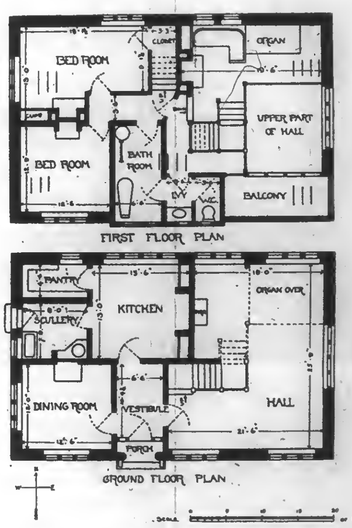


GROUND FLOOR PLAN



FIRST FLOOR PLAN

- A Country House in North Staffordshire.

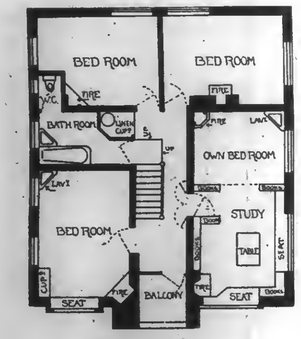


FIRST FLOOR PLAN

GROUND FLOOR PLAN

Plan Showing Hall as Main Living Room, Carried up Two Stories to Allow of an Organ Gallery.

Barry Parker and Raymond Unwin, Architects.



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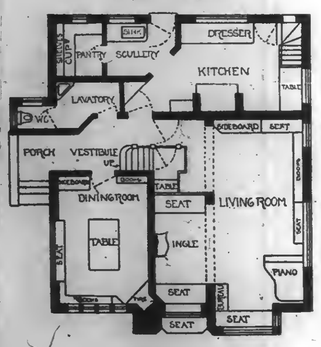

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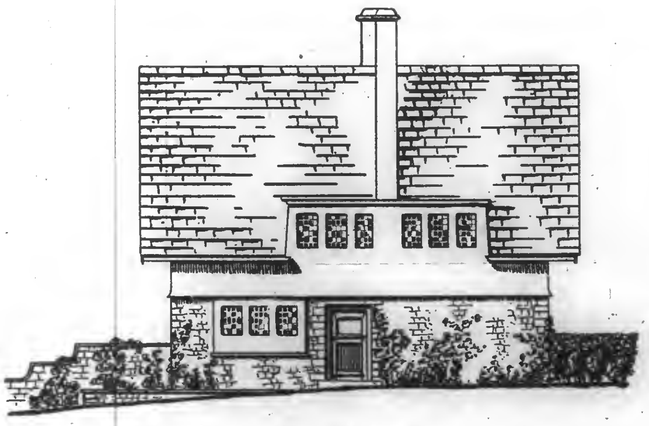
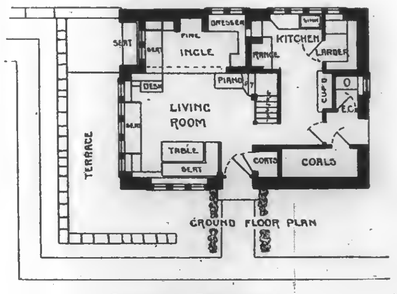
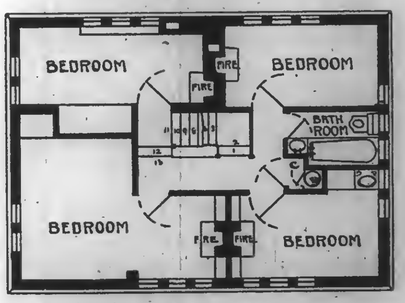


SOUTH ELEVATION

WEST ELEVATION



Cottage in Derbyshire.

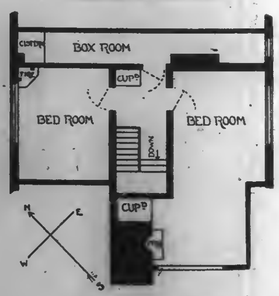


FIRST FLOOR PLAN

SCALE 0 5 10 15 20 OF FEET

Cottage in Derbyshire.

Barry Parker and Raymond Unwin, Architects.



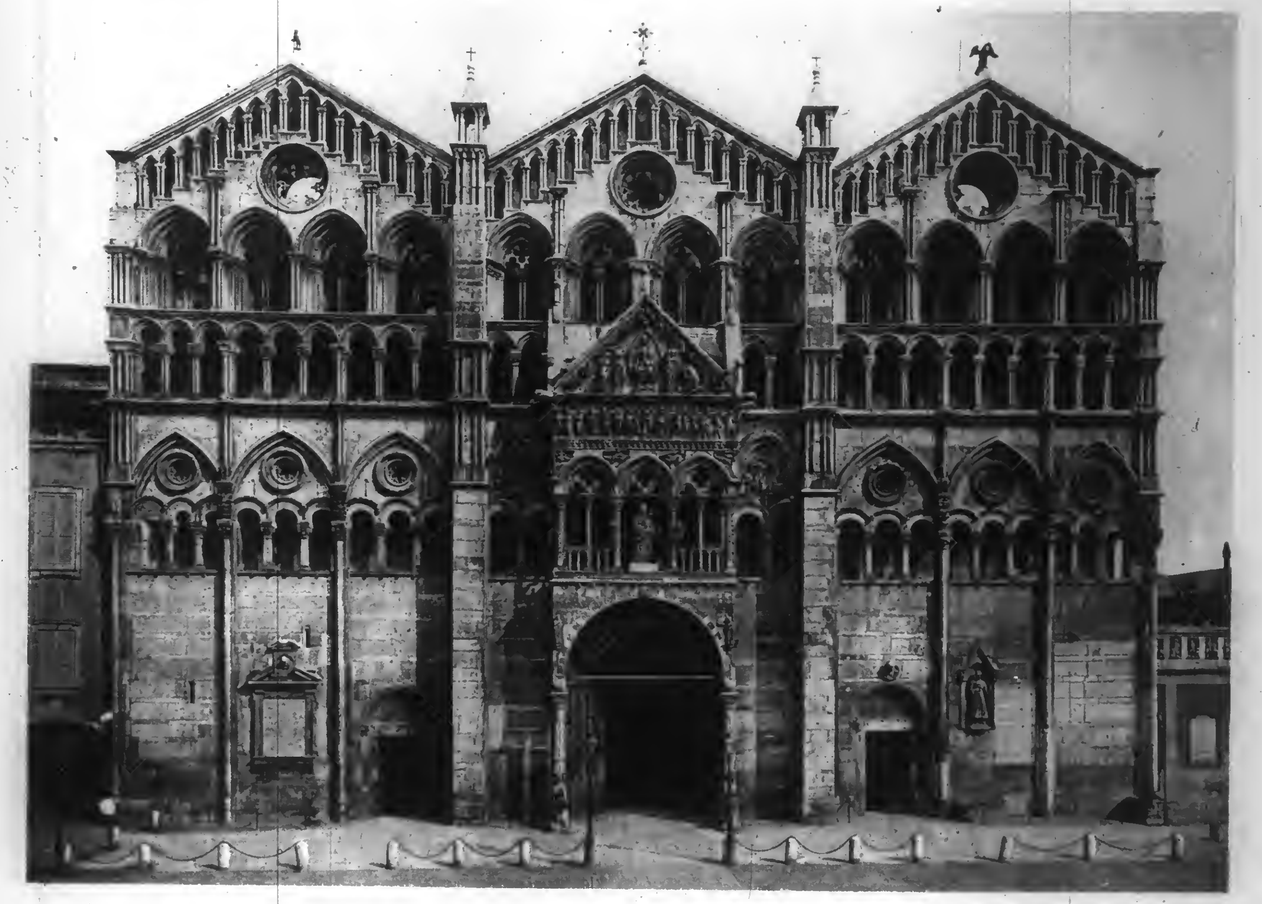
SECOND FLOOR PLAN

Plan of House at Hampton for a Literary Man.

Illustrations Accompanying Paper in this Number on "The Art of Designing Small Houses and Cottages," by Barry Parker and Raymond Unwin.

RESIDENCE OF J. D. ST. DENIS LEMOINE, ESQ., WILBROD STREET, OTTAWA, ONT.

A. M. CALDERON, ARCHITECT.



FAÇADE OF CATHEDRAL AT FERRARA, ITALY.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
APRIL 1901.

The Canadian Architect and Builder

Vol. XIV.—No. 161. May, 1901.

ILLUSTRATIONS ON SHEETS.

Working Drawings of a Suburban House—R. J. Edwards & Wagner, Architects.

ILLUSTRATIONS IN TEXT.

Design for Small Suburban House (Illustrating Paper by Mr. Searles-Wood before the London Architectural Association.)

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Photogravure Plate—St. George's Cathedral, Kingston, Ont., (Reconstructed)—Messrs. Power & Son, Architects.
" Branch Bank of Canadian Bank of Commerce, Bloor Street, Toronto—Messrs Darling & Pearson, Architects.
Summer Residence, Balmy Beach, Toronto—Messrs. R. J. Edwards & Wagner, Architects.
Interior of Chapel, Loretto Abbey, Toronto—Beaumont Jarvis, Architect.

CONTENTS.

Editorial Notes	89-90	Suggested Competition for School of Science	100
The Effect of Freezing on Concrete	90-91	Legal	108
Montreal Correspondence	92	Personal	109
Students' Department	93	Correspondence	120
Manitoba Correspondence	96	Agreement as to Wages in Toronto	v.
Skyline	97-100	Architecture at the R. C. A. Exhibition	vi.
Municipal Improvements	100		

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" W. H. Elliott, of Messrs. Elliott & Son Co., Toronto.
" J. C. B. Horwood, Architect, Toronto.
" A. F. Dunlop, R.C.A., Architect, Montreal.

Our Students' Department.

Attention is directed to the first of a series of articles on Portland Cements, which appears in the Students' Department of this number. Mr. J. R. Gardiner, architect, of Montreal, very kindly offered to prepare these articles for the benefit of students, who will, no doubt, appreciate his friendly interest in their welfare as well as the value of the information supplied. It is hoped that that other architects will follow the example set by Mr. Gardiner, by contributing from their store of knowledge and experience to the needs of the younger members of the profession.

Protection of Buildings from Lightning.

This forms the subject of an enquiry which is now being conducted by a special committee appointed for the purpose by the Royal Institute of British Architects. The committee invite from competent observers data relating to the effect of lightning strokes on buildings, whether fitted with lightning conductors or not. Particulars such as the following are asked for :—Description and situation of building struck, height above sea-level, position with regard to other buildings and high trees, and propinquity to wells ; whether rain was falling at the time, if not, whether rain preceded or followed the stroke, and at what interval ; as to the number of lightning rods on the building, giving position, height above roof, material (both of rod and staples) shape, sectional area, how finished at top and at bottom, condition after flash, &c. ; whether conductor was continuous ; particulars of earth connection : when conductor was first examined and tested ; nature of soil ; the precise nature of the injury to the building ; if any portion was set on fire ; damage to metal work, such as bells, rainwater and other pipes, electric bells or telephones ; distance from conductor of portion of building affected ; materials of roof coverings, and position of gutters and down pipes ; whether conductor was in contact with any other metal ; particulars as to metal-cresting, weather cocks, finials or flagstaffs on the building, stating distance from and the height above conductor ; if conductor was struck, whether damaged portions can be obtained for examination, &c.

Housing of the Poor.

In London and New York, earnest efforts are being made to provide better living accommodation for the poorer classes, thereby making life to them better worth living and lessening the amount of disease, vice and crime. In London, the problem is being dealt with by the County Council, which, as the result of experiments on a smaller scale, has now decided to invest $7,500,000 in the purchase of 225 acres of land on which to build 5779 workmen's cottages in Tottenham, a suburb in the north eastern district. These cottages will accommodate 42,500 persons. The rental will be $1.50 per week for a cottage of three rooms and a kitchen and $2.50 per week for a cottage of five rooms and kitchen.

By special arrangement with the railways, workmen residing in this district, will be carried to and from their place of employment at one quarter regular fares. The enterprise is expected to pay a small dividend. In New York model tenements have been erected by private enterprise to the value of $1,500,000. The results have been so satisfactory that it is proposed to invest $1,000,000 more. These model tenements, while in striking contrast to the overcrowded buildings in which the poorer classes have heretofore lived, and are yielding satisfactory returns to the investors.

An Interesting Legal Point.

The insurance companies holding policies on the Advertiser building, recently burned in Boston, contend that they are only bound to pay the amount of the policies or replace the building with one of identical character. The by-laws enacted since the time of the erection of the burned building, prohibit the putting up of such a structure. The owners of the building claim that the insurance companies are under obligation to put up a structure that shall comply with the existing law. To do this would involve a much larger expenditure than would be required to build a counterpart of the old building. An appeal will therefore be made to the Courts to decide the measure of the companies' responsibility. The verdict will have an interest for building owners and insurance companies everywhere.

THE EFFECT OF FREEZING ON CONCRETE.*

By Walter A. Rogers.

With the constantly increasing use of concrete, questions as to its qualities are continually arising. It has been a commonly accepted opinion among engineers that the building of concrete masonry, especially above ground, during freezing weather is bad practice and one to be avoided if possible. The writer has frequently found it necessary to put in Portland cement concrete footings during the winter months and considerable care has always been taken to protect the freshly-mixed concrete from freezing. There has, however, been a feeling of uncertainty as to the effect of freezing if it should take place before the concrete has thoroughly set.

In order to determine as far as possible by experiment the result of freezing Atlas Portland cement concrete and Louisville cement concrete, which were taken as types of Portland and natural cements, eight 12-in. cubes of each kind of concrete were made and tested as described in the accompanying tables :

The gravel was composed of about two-thirds clean coarse sand and one-third small stones. The crushed stone was crusher-run limestone. The cubes were all made by the same man and those for the same kind of cement were made on the same or on succeeding days. The specimens were moulded in boxes made of 1-in. boards, and left in these until taken out to be broken. Two of the eight cubes of each kind of concrete were mixed with salted water in the proportions of one pint of salt to ten quarts of water. The other six were mixed with ordinary hydrant water. Two of the latter were kept in a warm office until broken ; they were used for purposes of comparison. Four were placed out of doors as soon as mixed in a temperature considerably below zero, and left outside for 28 days, when two of them were broken and two taken into the warm office and left for 28 days more before breaking. The two cubes of each test which were mixed with salted water were placed outside as soon as made, and left to freeze and thaw until broken at the end of 28 days.

Referring to table No. 1 showing the effects of freezing on the Atlas cement cubes, it will be seen that the two cubes which were left in the office, Nos. 103 and 104, developed an average strength at the end of 28 days of over 185,000 lbs.—which was the capacity of the testing machine employed ; but probably the strength of these cubes did not much exceed this amount, as one of them began to fail at that load.

The two cubes which were placed outside in temperature of about 15 degs. below zero immediately after being made, Nos. 147 and 148, developed an averaged strength of 115,000 lbs. The two cubes made at the same time and left out of doors for the same length of time and then kept in a warm room for 28 days more developed a strength of over 185,000 lbs., probably greater than that shown by the two cubes left in the office for 28 days, since no sign of failure by either of these cubes was manifest, indicating that freezing of these four cubes had the effect merely of causing the concrete to harden more slowly than it would have done under more favorable conditions of temperature. The two cubes mixed with salted water and then exposed to the cold for 28 days developed a strength of over 185,000 lbs., probably about the same as that of the two unexposed cubes.

The deductions which may be made from these Portland cement tests are :-(1) Freezing before setting does not seem to injure the Portland cement concrete even if, after having frozen hard, the concrete is exposed to alternate freezing and thawing weather. (2) Exposing freshly-mixed Portland cement concrete to freezing temperature seems to affect its rate of hardening, making it slower, it appears, but eventually the concrete will be just as good as if it had not been exposed to the cold (3) The use of salt seems to largely counteract the effect of the cold in causing slow hardening.

Table No. 2 shows the tests of Louisville cement concrete cubes. It will be seen that the cube left in the warm room, No. 119, and broken at the end of 28 days developed a strength of 43,400 lbs., while cubes No. 153 and 154, which were placed outside in a temperature of 10 degs. below zero as soon as made, showed an average strength of 33,000 lbs. at the end of 28 days. Cubes Nos. 157 and 158, made at the same time as the last two and left out in the cold for the same length of time and then kept in a warm office for 28 days longer, had an average breaking strength of 52,500 lbs. The two cubes mixed with salted water and exposed for 28 days developed a strength of 35,000 lbs., being but little more than those treated in the same way and mixed with fresh water.

The same deductions may be made from the tests of Louisville cement concrete as from the Atlas tests, with the exception that the use of salt seemed to have had little, if any, effect on the strength of the cubes exposed to the cold. The fact that the extreme cold seems to have merely caused the hardening of the concrete to proceed more slowly than under more favorable conditions of temperature is brought out in a marked manner by the fact that the cubes left out in the cold for 28 days and then kept inside for 28 days developed a strength of 20 per cent greater than those which were kept inside for 28 days and then broken.

*A paper read before the Western Society of Engineers of U. S. A.

A certain retaining wall was built of Louisville-cement concrete, faced on the top and front with Portland cement mortar. The weather was quite cold part of the time while the concrete was being mixed, and part of it must have frozen before setting had entirely taken place. The 2-in. plank form was left in position until the Spring, and about 4 in. or 5 in. of sand was placed on the top of the wall. In removing the form last Spring it was found that the body of the concrete, to all appearances, was in good condition. About six inches from the top however, the Portland cement facing was badly cracked and by sounding occasional spots were found both in the Portland cement facing and in the back of the wall, where there seemed to be a thin loose shell. Evidently these are surface defects, and the wall itself appears to be in good condition.

The writer believes that the foregoing tests indicate that concrete work with cement possessing qualities similar to those tested may be carried on safely during moderately cold weather by using proper precautions, such as warming the materials and the water, and by so protecting each layer of concrete that its top shall not freeze before the next layer is laid.

[Note.—The temperatures recorded are Centigrade.

TABLE No. 1.

Tests to Determine the Effect of Freezing on Atlas-cement Concrete.
Concrete composed of 1 part cement, 3 parts gravel, 4 parts broken stone.

No. of Cube	Date made.	Date broken.	Variation of Temperature. Max.	Min.	Treatment of Cube.	Crushing-stress in lbs.	Behaviour in Testing-machine.
103	*Feb. 6, 1899.	Mar. 6, 1899.	80°	18°	Kept in warm office from time made until broken.	Over 185,000	Unbroken, slight flaking, no cracks.
104						185,000	Slight flaking, split on one side in line of stress.
147	Feb. 6, 1899.	Mar. 6, 1899.	57°	-24°	Placed in open air as soon as made and left to freeze and thaw until broken.	130,000	Split and flaked in line of stress.
148						99,600	
149	Feb. 7, 1899.	Mar. 7, 1899.	57°	-24°	Mixed with salt water, placed in open air as soon as made and left to freeze and thaw until broken.	Over 185,000	Unbroken, slight flaking, no cracks.
150						185,000	Slight flaking, split on one side in line of stress.
151	Feb. 7, 1899.	Apr. 4, 1899.	57° Outside and 85° Inside.	-24° 32°	Placed in open air as soon as made and left to freeze and thaw for 28 days, then placed in warm office for 28 days more, then broken.	Over 185,000	Unbroken, slight flaking, no cracks.
152						Over 185,000	

*Fire went out and temperature dropped below freezing for a short time on two nights.

TABLE No. II.

Tests to Determine the Effect of Freezing on Louisville-cement Concrete.
Concrete composed of 1 part cement, 2 parts gravel, 4 parts broken stone.

No. of Cube.	Date made.	Date broken.	Variation of Temperature. Max.	Min.	Treatment of Cube.	Crushing-stress in lbs.	Behaviour in Testing-machine.
119	Feb. 13, 1899.	Mar. 13, 1899.	85°	40°	Kept in warm office from time made until broken.	43,400	Gradually failed by splitting and flaking in line of stress.
120						Defective	
153	Feb. 11, 1899.	Mar. 11, 1899.	57°	-10°	Placed in open air as soon as made and left to freeze and thaw until broken.	28,700	—
154						37,000	
155	Feb. 13, 1899.	Mar. 13, 1899.	57°	-10°	Mixed with salt water, placed in open air, and left to freeze and thaw until broken.	34,200	—
156						35,700	
157	Feb. 11, 1899.	Apr. 8, 1899.	57° Outside and 85° Inside.	-10° 40°	Placed in open air as soon as made and left to freeze and thaw for 28 days, then placed in warm office for 28 days more, then broken.	54,200	—
158						50,900	

THE GLASGOW EXHIBITION.

The site of the Glasgow Exhibition comprises 73 acres intersected by the River Kelvin. The buildings, which were designed by Mr. James Millar, I.A., of Glasgow, cover an area of 20 acres. They are divided into three groups—the general industrial section, the machinery hall, and the grand hall for entertainments. They are designed in the Spanish Renaissance style, oriental coloring, the leading feature being the great dome 200 feet high and 80 feet in diameter, with four accompanying towers, each 160 feet high. A balcony 400 feet in circumference and 25 feet wide forming a promenade, surrounds the dome at a height of about 100 feet. This balcony is reached by powerful lifts and wide stairways. A colonnade 200 feet long and 80 feet wide with floor of ornamental black and white marble, leads to the main entrance beneath the great dome.

Next to Great Britain, Russia occupies the largest amount of space. A grant of £30,000 was made by the Russian government, for the erection of buildings which are all designed in the old Russian style, put up by Russian workmen, mainly with the aid of short-handled axes.

A USEFUL CEMENT TESTING DEVICE.

Mr. W. F. Goreham, an English cement works expert, has patented a device called a "Flourometer" for separating the flour from residue of cement, thus enabling the proportion of cementitious matter in the cement to be exactly arrived at. In this device, which is intended to furnish a means of test of quality of cement to architects and contractors, and other users of cement, air under a certain fixed pressure is supplied by an aerometer attached to the tube of the flourometer. The cement is placed, in a fixed quantity carefully weighed, into a conical glass, and a central tube is brought into it, with the bottom edge cut in a particular way. Air is then forced down the central tube, and rising up through the cement, lifts through the vertical tube all that is light enough to be lifted by its current, which is then deposited in a special settling chamber. About 2 to 3 per cent. of the flour is lost, but the residue always remains intact to be weighed for proportion.

The first stone of Cologne Cathedral was laid on August 15, 1248, and the body of the edifice was not opened until August 15, 1848, 600 years later to the very day. It was not, however, until August 15, 1880, that the splendid structure was finally completed, having thus occupied in building the "record" time of exactly 634 years.

Branch Office of the CANADIAN ARCHITECT AND BUILDER,
Imperial Building.

MAY 6TH, 1901.

THE NEW BUILDING BY-LAWS.

"The Montreal Building By-law of 1901" was passed by the City Council on the 4th February, and thanks are due in the first place to the committee of the P.Q.A.A., who about two years ago at an immense amount of labour studied the question and wrote out the text of the By-law, and secondly to Alderman Hart and those who worked with him for getting the by-law passed after having laid on the table so long.

We can congratulate the city in now having, in most particulars at any rate, a Building By-law that is workable and up-to-date and we trust that Mr. Chausse, the Building Inspector, will see that the various clauses are carried out. Mr. Chausse has already made great changes in his Department in the short time he has been in office and we are glad to be able to report that this Department is, at the present time on a good business-like footing. May it never be allowed to again sink to the level from which it has at last been raised, is the hope of all those interested in the City's welfare.

The By-law has been printed and it would be well for all architects and contractors, who have not already obtained a copy to do so and make themselves conversant with the various changes.

There is one good clause to which we would especially like to draw attention viz:—No permits shall be given for the erection of 3rd class buildings within the following districts bounded as follows:—

On the N.E. by Delorimier Ave., Craig and St. Andre Sts.
" " N.W. " DeMontigny, St. Urbain, Ontario, Berthelet St. and Burnside Place.
On the S.W. by Mountain and Record Sts.
" " S.E. " River St. Lawrence.

The text of the By-law was published in the CANADIAN ARCHITECT AND BUILDER for November and December, 1899, and but few alterations have been made. The portion referring to Plumbing has not been included, as it is intended to make a separate By-law of this part.

THE P.Q.A.A.

The Vice-President and Montreal members of the Council were "At Home" to the members of the Association on April 25th. Mr. Venne gave a very interesting lecture on the Certosa di Pavia, which was well illustrated by photogravures of different portions of the buildings, one of which showed the similarity between its entrance gateway to that of the Ponce de Leon Hotel in Florida erected some few years ago from plans made by Messrs. Carriere & Hastings.

The lecture was preceded by some capital selections on the violin as well as one or two songs, and Mr. Doran made a few remarks in reference to the lecture, saying that architects in the rush of every day practice had not the time necessary to work out the details of carving, etc., in such work as shown on the board and that he would like to suggest that they should be allowed to call in an artist to aid them in this class of work. This seems to us to be a dangerous idea to advance as if architects have to call in the aid of an engineer to draw out their steel construction and an artist to help them in their carving and mouldings that are a little beyond those used in every day practice, we are afraid that clients will begin to wonder what an architect is supposed to know beyond or above a contractor.

An architect from our point of view should be an artist with the practical knowledge necessary to be able to carry out his dreams on a sound constructional basis.

At the request of some of the members of the Association, a special general meeting has been called for May 8th to consider the alterations recently made in the "Schedule of Charges."

LOCAL PROSPECTS.

Nearly all the local architects appear to be busy and a large amount of work has been tendered on during the past month. The chief topic of conversation among architects at the present is the giving of the contract for the new Bank of Montreal building to Messrs. Norcross Brothers, of Worcester, Mass., and New York. Naturally all persons interested in the welfare of our Canadian builders are feeling sore at seeing the best contract given out so far handed to an American firm, even though it is one of the standing of Norcross Brothers. We regret very sincerely that the Directors saw fit to give the work to a firm not residing in this country, as their action is apt to be misconstrued as a kind of slur on the capabilities of our local men. We believe that the decision of the Board was only influenced by dollars and cents, and as the American firm was the lowest tenderer the contract was awarded to them. We feel, however, that Americans rarely, if ever, show us any reciprocity in this sort of thing and when it is a public body such as the Bank of Montreal, who are so bound up with the interests of the country, and are, we might say, a national institution built up out of Canadian enterprise, it seems a wrong policy on their part to pass by Canadian contractors. A building of this class is surely not above and beyond our contractors, for if such is the case, and we do not for one moment think so, the sooner they look into the matter the better for their own and their country's reputation. In the matter of cost, we can imagine that as certain materials must come from the United States that American firms may have been able to make better terms in certain cases than our local men—"Alas! now this way and now that turns fortune's wheel." Some of the other buildings already tendered on are: The new building for the Royal Insurance Co., which will form an addition to their present building on Place d'Armes, from plans by Messrs. Hutchison & Wood; a large factory for Messrs. Gault Brothers, on Hay Market Square, in the office of Messrs. Finley & Spence; College Buildings for the Grande Ligne Mission at Grande Ligne, from designs by J. Rawson Gardiner, and a warehouse for Jesse Joseph, Esq., to replace the buildings recently burned in the Board of Trade fire at the corner of St. Peter and Lemoine streets. This is the first attempt at rebuilding in the burned district, and the men are now clearing away the debris in the cellars of the burned structure. Mr. Coristine has had plans prepared for a large office building to replace his buildings burned in this district, but no contracts have so far been given out. The Council of the Board of Trade have done nothing definite, so far as we are able to ascertain, in preparing plans, though it is generally considered that some decision will have to be arrived at shortly. The C.P.R. Telegraph building is now nearing completion but the Grand Trunk Building does not show signs of being completed before the autumn. There should be no good draughtsmen idle at the present time as from word received both from New York and Chicago, there is great scarcity of good draughtsmen in both those cities.

THE PAN-AMERICAN EXHIBITION.

No doubt many of our local architects are looking forward to a trip to the Buffalo Exhibition. The various buildings have all been designed by eminent architects, and as colour has been extensively used in the general scheme, the result, no doubt, will be interesting. Colour has generally proved somewhat of a "bete noir" to architects in a northern atmosphere so that it may lead to further endeavors in this line, but so far any attempt beyond what is sometimes called the sombre has usually been unsuccessful, even if not verging on the disastrous. The Exhibition was to have been opened by May 1st, but the weather has been very unpropitious the last month so that the opening day has had to be postponed. A list of the chief buildings with the names of their designers is given here, as it may prove of interest to those considering a trip to the Exhibition:

Liberal Arts and Agriculture .....Shepley Rutan and Coolidge.
Horticulture, Forestry and Graphic Arts..Peabody and Stearns.
Machinery and Transportation.....Green and Wicks.
Administration Building.....Babb, Cook and Willard.
Mines and Ethlogy.....George Cary.
Electric Power.....Howard, Cauldwick and Morgan.
Landscape Plan, etc .....Carriene and Hastings.

The board also retained the services of Mr. Carl Bitter for the sculpture and Mr. Turner for the mural paintings and decorations

These Exhibitions seem to be annual affairs now and soon we will be able to use them as Experimental Stations for our architects.

STUDENTS' DEPARTMENT.

NOTES ON CEMENT.

By J. R. GARDINER.

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The following notes on "Cement" are intended as a short synopsis of what others have said with an attempt to place them in a clear and concise manner capable of being understood by the student and not in any way as an addition to the already voluminous literature on this subject.

CEMENTS.

As cement can be considered one of the most important building materials that an architect uses and furthermore one that is being used more extensively every day it is necessary that the student of architecture should understand in outline at all events the chief distinctive characteristics as well as the mode of manufacture of the various types in order that he may use them intelligently.

The basis of all limes and cements is Carbonate of Lime and in order that lime may contain hydraulic properties it is necessary that it be chemically combined with some form of Silica—usually clay, which is a hydrated Silica of Alumina. It is largely the proportions in which these two materials are mixed that constitutes the type of cement to which it will belong. There are two heads under which cements are usually classified:—

1. NATURAL CEMENTS.
2. ARTIFICIAL CEMENTS.

Under the heading "Natural" cements is usually included all so-called Roman cements as used in England, the hydraulic limes as found in France and Belgium, and the natural rock cements used so extensively in America.

Let us first take the industry in America:—

1. THE NATURAL CEMENT INDUSTRY IN AMERICA.

Large deposits of Hydraulic Limestone, capable of producing good natural cements, are found in the United States, chiefly in New York, Maryland, Pennsylvania and Kentucky—and also in the Province of Ontario in Canada.

The natural cements produced from these limestones differ from hydraulic lime in that they do not slake at all, their bulk and temperature remaining the same during both mixing and setting. They also set very rapidly either under water or in the air. The most distinctive feature of these cements is the marked difference in the amount of magnesia they contain and they are on this account usually divided under the two headings:

1. Lime Cements or those containing from 2 to 4% of magnesia.
2. Magnesian Cements or those containing from 12 to 30% of magnesia.

The larger part by far of the deposits worked come under the latter category as they contain all the well known "Rosendale" brands. These magnesian cements set and acquire strength rather more slowly than the lime cements but eventually equal them. They do not heat on mixing with water and do not withstand frost as well as the lime cements when first mixed.

The lime cements gain their strength very rapidly but they have to be very carefully prepared as they have a tendency to heat if too rich in lime and to blow if too strong in silicates.

By the following tables it will be seen that the chemical composition of the various brands found in different parts of the country varies considerably. Great care has to be used also in the same quarry as different strata produce varied results so that analyzing has to be resorted to continually if the best results are expected.

	Rosendale.	Milwaukee.	Louisville.	Fort Scot.	Round Top.
Ca. O.	34.64	33.40	46.64	49.80	45.66
Mg. O.	14.82	22.60	12.00	12.20	2.80
Si. O_2	16.48	13.80	20.40	17.60	21.70
Al_2O_3	10.93	4.00	4.76	4.00	8.30
Fe_2O_3	4.65	2.80	3.40	5.00	4.15
$Na_2O + K_2O$	1.80	2.50			
SO_3	1.04	2.59	2.57	2.04	1.30
$CO_2 + H_2O$	4.50	9.50	6.75	4.50	8.20
(Silicates undecomposed.)	12.40	11.20	3.74	4.20	8.00

The "Rosendale" cements, of which there are several different brands, are the best known natural cements in America. They are the standard of the magnesian variety, and form nearly half of the total production of natural cement in America. The "Round Top" is usually taken as the typical lime cement. The supply is somewhat limited, and is therefore chiefly used in its own district, supplying Washington, Baltimore and the more southerly cities. The manufacture of these cements is similar with either variety. The hydraulic limestone is usually burned in a draw kiln which contains enough stone to make from 400 to 600 barrels. The stone and coal is laid in alternate layers, and is usually drawn twice in twenty-four hours; but this depends largely on the variety of stone. It is carefully sorted, and all under-burned portions and clinkers are then removed. In the case of lime cement it is then either sprinkled with water or steamed, in order to slake any excess of lime. It then passes to the mill, where it goes through the process of being crushed and carefully ground, and in the better cements screened.

The cement is then packed in barrels, which in the Eastern States contain 300 pounds, while in the West 265 pounds is the usual standard. In regard to fineness, which in late years has been receiving a good deal of attention, both from engineers and manufacturers, the best cements are expected to pass the following test:

Residue on 200 mesh, 10 per cent.
" 100 " 6 "
" 50 " 2 "

Although a large proportion of cements tested will no doubt be found to leave 20% residue (at least) on a 200 mesh. As to strength and reported tests of natural cements one is as far from arriving at a certain goal as in Portland cement testing. There are so many pitfalls one can stumble into in testing cement that one is apt to feel disheartened with the numerous tests showing almost any result one could wish. However, the following table prepared by Mr. Clarke for the Boston Main Drainage work from over 25,000 tests and made with great care to show the result of comparison between Natural and Portland cements will no doubt be of interest:

NATURAL CEMENT.

	Neat	1 cement to 1 sand	1 cement to 2 sand	1 cement to 3 sand
7 days	92	56	24	14
28 days	145	116	60	35
6 months	282	190	125	80
12 months	290	256	180	121
PORTLAND CEMENT.				
7 days	303	160	126	95
28 days	412	225	163	140
6 months	468	347	279	198
12 months	494	387	323	257

These tests shew the average of several brands and give a fair idea of the proportional value of the two varieties.

The American Society of Civil Engineers gives the following table as approximate tests of the two cements, natural and artificial:

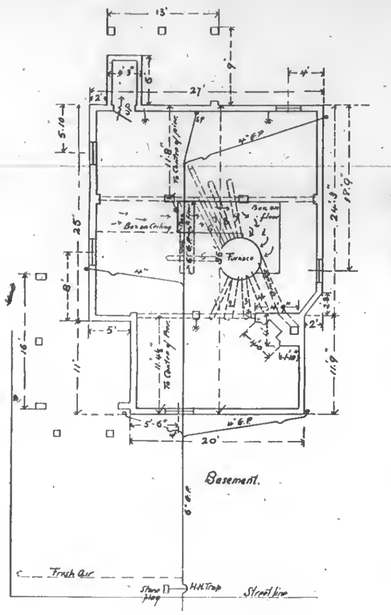
NATURAL CEMENT.

	Neat.	1 Cement 1 Sand.
7 days	60 to 100	30 to 50
28 days	100 to 150	50 to 80
1 year	300 to 400	200 to 300
PORTLAND CEMENT.		
	Neat.	1 Cement 3 Sand.
7 days	250 to 550	80 to 150
28 days	350 to 700	100 to 200
1 year	450 to 800	200 to 300

The above tables shew that, as a rule, taking equal quality in both natural and Portland, one part of natural cement and one of sand is equal in ultimate strength to one part of Portland cement to three parts of sand. The natural cements set quicker, but do not at first attain so great strength.

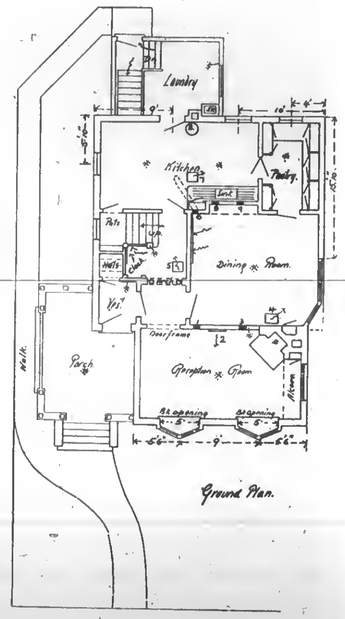
The color of natural cements varies considerably from a light buff through a gray resembling Portland to a darkish brown as most Rosendales. This variation in shade is due to the proportion of oxide of iron contained in the stone, and has in no way any effect on the value of the cement, although two barrels of the SAME brand of different shade would probably indicate that the lighter one was of unburned rock.

In regard to weight, the American Society of Civil Engineers in their report on cement tests, say: "The relation of the weight of cement to its tensile strength is an uncertain one. In practical work, if used alone, it is of little value as a test; while in connec-



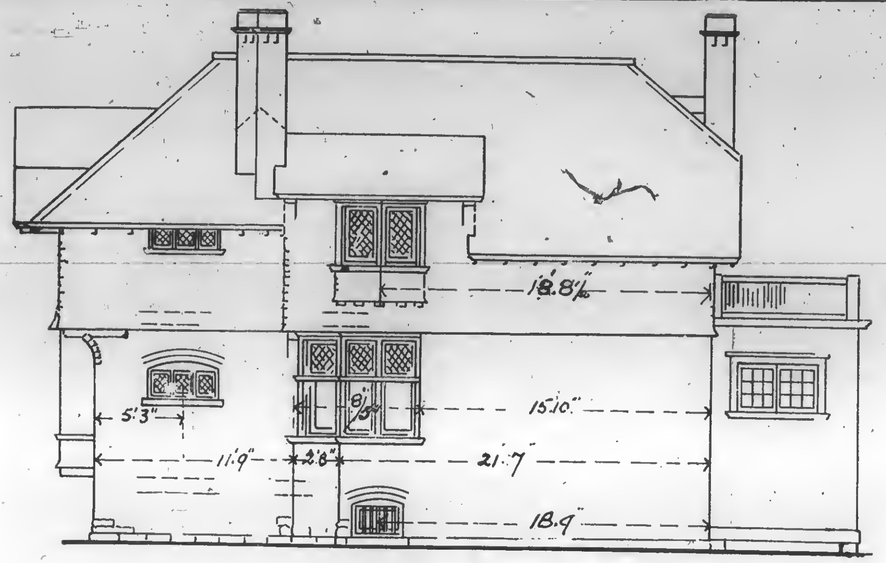
East.

West.



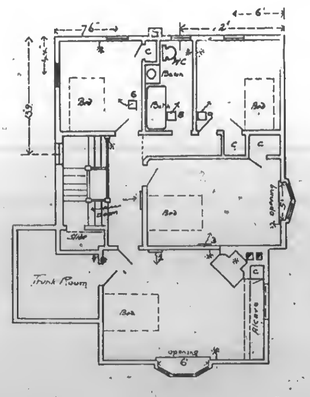
WORKING DRAWINGS FOR MODERATE COST SUBURBAN DWELLING.

R. J. Edwards & Webster, Architects.



South.

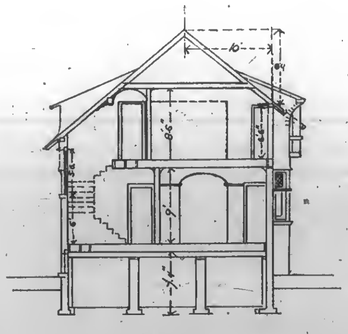
North.



First Floor.

WORKING DRAWINGS
FOR
MODERATE COST
SUBURBAN DWELLING.

R. J. Edwards & Webster, Architects.



Section

tion with the other tests recommended it is unnecessary, except when the relative bulk of equal weights of cements is desired." Fine ground cements are lighter than coarse ground, but under-burned cements are also lighter than well burned, so that it is hard to depend on weight alone as a sure test except in conjunction with other means of testing.

The large quantity of these "Natural" cements used in America has made this material a most important one to both architect and engineer, and a cursory glance at the extent of the industry will therefore no doubt be of interest.

There were, in 1898, 76 mills manufacturing natural rock cements in the United States, 29 of which were situated in New York state, turning out chiefly a brand of "Rosendale."

This cement derived its name from the township of Rosendale, Ulster county, New York. The other plants are situated in almost every other state, due chiefly on account of the cost of shipping being high in proportion to the cost of manufacture. The chief producing states are Maryland (where most of the lime cements are made), Pennsylvania, Kentucky and Indiana, the total output being over 8,400,000 barrels, of which New York state has nearly one half to her credit.

Canada in 1900 produced 125,428 barrels of natural cement all of which was manufactured in the province of Ontario where there are 4 separate plants.

2.—THE NATURAL CEMENT INDUSTRY IN EUROPE.

In Europe the natural cement industry is carried on chiefly in Great Britain, France and Belgium.

Natural cements in England are made from cement stones or nodules found in thin strata among limestone and also in the London clay. In 1796 Mr. Parker took out a patent for what he called Roman cement, and which has for this reason sometimes been called Parker's cement, and was made from calcining these nodules from the London clay. These natural cements are generally termed after the name of the district where they are manufactured, as "Sheppy," "Harwich" or "Whitby" cements, and usually contain from 30 to 40 per cent of clay. Medina cement is made from the septaria found in Hampshire and the Isle of Wight, as well as from those dredged out of the bed of the Solent. It is generally considered superior to most Roman cements. It sets very rapidly, and is of a light brown color.

A large proportion of the material used in the manufacture of natural cements in England is unfortunately very variable and irregular, so that the results obtained from their use have not always been satisfactory, and Portland cements have to a large extent for this reason driven the natural cements out of the field.

At Boulogne, which is the chief centre of the industry in France, there is a soft deposit which can be excavated with pick and shovel, and consists of 22.6 per cent of clay and 76 per cent of carbonate of lime. It therefore makes a sufficiently hydraulic material to be termed a very slow setting hydraulic cement.

THE ARCHITECTURAL STUDENTS' CLUB.

For some time prior to the formation of this Club, there had been a growing feeling amongst many of the Toronto students, that something was needed to draw them together, and to promote some enthusiasm in the different branches of architectural work, especially design.

When, therefore, Mr. D. W. F. Nichols, who is now president of the Club, proposed its formation, he met with vigorous support from a majority of the students. On his invitation a number met on the evening of Jan. 29th, 1901, at the office of Messrs. Burke & Horwood, 28 Toronto street, when it was finally agreed to form a club to be known as "The Architectural Students' Club." The following officers were elected: President, D. W. F. Nichols; Vice-President, A. H. Russell; Sec.-Treas., A. M. Weir; Committee, J. M. Crysler and H. A. Payne. It was decided to meet every Tuesday evening to have competitions and talk over any matters of interest.

Several meetings were held at which a few new members were enrolled, but when studio work commenced it was found impracticable to meet on Tuesday evenings, as some of the students attended the studio of the O.A.A. and others that of the T.A.E. Club. In view of this it was decided to meet on Saturday evenings, and through the generosity of the O.A.A. their rooms at 96 King street west were obtained for that purpose. Several professional men consented to address the Club on different topics, which greatly added to the interest of the gatherings.

This season has been to a great extent experimental to the Club, but its officers and members feel fully satisfied that it has accomplished its object, viz., the creating of an enthusiasm in the work and a stronger spirit of fellowship amongst the members.

The lectures given were very interesting and much appreciated by the members of the Club, and the committee expects to have an interesting programme for next fall.

MANITOBA CORRESPONDENCE.

WINNIPEG, MAY 13, 1901.

The "Free Press," of this city has of late been publishing in its columns extracts from the "Free Press" of 18 to 20 years ago. In one of these extracts the writer's name appears in an architectural connection with some buildings of that ancient time. As we look back, what great changes have taken place, what wonders time has wrought, and how the small and scattered city of that day has grown and grown till it now is a good city to dwell in, full of life and progress, where all the comforts of life may be obtained and at no great cost either. The crude store and warehouse of frame or logs has given place to the handsome and palatial shop and the solid and substantial wholesale warehouse; the small cottage or humble home without fence, garden or trees is now exchanged for the comfortable and picturesque home with all modern comforts or the stately residence rearing its well proportioned outline amid the forest trees of by-gone days, or the flower beds and well kept grounds of more modern times. We may ask why is this? and the answer comes back that Winnipeg, Manitoba and the Great North West does now, and will more so in the near future, occupy a most modern place and wield a mighty influence over the prosperity, progress and grandeur of our noble Dominion.

In this procession architecture takes a prominent place, for is not architecture beauty of outline, stability of construction and utility of arangement? As our cities grow in size and richness, and the country takes its place in the functions of the world, architecture will help to lead the way; it has done so in the past, it will do so more in the future. Is it not well then to acknowledge its power, admire its beauty, and note its progress?

In this city of the plains we are making substantial progress, and the year has opened briskly in the building trade; many structures are in course of erection and many more are spoken of. Of a truth in the spring time we are very likely to put on our magnifying glasses and things and times appear greater than they really are. From the present outlook, there will be work enough in all departments of the building trade, but not such as to warrant a large influx of artisans. Our architects and contractors are not idle, but we may say that their hands are not full, and from the architects' standpoint we may remark that more than one could have found time to design and arrange the drawings for the buildings which have been placed in the hands of outside architects. We think there could be found here architectural ability enough to design and carry out any building which has been erected in this city or Province.

Could our architects have the freedom to use the material and money which we presume has been placed at the disposal of our outside brethren, we venture to say, they would have achieved good results from the use of the same, both as regard beauty, stability and utility. While this holds good in regard to our Canadian architects it particularly applies in the case of commissions placed in the hands of a foreign architect.

An architect from Minneapolis has designed an apartment building for which the excavation is now being taken out on McDermot avenue. While we have not a word to say against this gentleman either as an architect or a gentleman, still we think our citizens might have placed their commission with some of their fellow-citizens in the architectural profession without disadvantage to themselves or to our city.

This incident has a wider range and a greater influence than might at first appear. If we wish to foster arrhitecture in our midst and encourage national architectural advancement, we should be ready to employ local talent where it is obtainable.

In regard to apartment buildings, we may add that there are several now in the city and there seems to be a demand for such accommodation. Our long winters no doubt are a factor in deciding the question of being housed in buildings of this character.

While these buildings are to a certain extent public, we think it should be the aim to make them as private as possible. In one instance to which we will refer, The "Avalon," on Notre Dame avenue, this has been accomplished by providing a private hall

(Continued on page 115.)

SKYLINE.*

BY HASTWELL GRAYSON, B.A.

Many many years ago Sir Walter Scott's poetic fancy led him to advise intending visitors to Melrose Abbey to "go visit it by the pale moonlight." There is a tradition that he did not practise what he preached, for on the only occasion when he went to "view fair Melrose aright" a passing cloud obscured the moon altogether. But however that may be the idea in the poet's mind seems to have been that in a strong light the abbey lost some of its charm. Stripped and ruined, roofless and ivy-clad, the architecture had perished and little remained except sentiment and a skyline. The buildings which we build to-day are not likely to have much sentimental value in our lifetime, but nearly all can have a skyline from the commencement. Scott is right—a skyline, like sentiment, has greatest power in a pale light. Defects arising from poor detail, meaningless features, and the poverty of materials, are gradually lost as the light fades, but the outline becomes more manifest. So true is this that Ruskin advises the young architect to try and conceive his buildings "as the dawn lights them and the dusk leaves them."

Except indirectly, the ordinary text-books hardly allude to the importance of skyline, and I cannot find that anyone has ever tried to analyse the why and the wherefore of an effective silhouette. I propose after tracing the influence of the earlier and greater styles of architecture in outline to venture on a few theories for which I cannot quote any authority.

Mr. Ingress Bell has pointed out that the ancients for various reasons paid little attention to skyline. The earlier Egyptians were content with mass, and were satisfied if their buildings were impregnable to time. Later they devoted much time to colour, while still chiefly relying on mass. The Greeks, perhaps consciously, kept their outlines exceedingly simple in order that nothing might detract from the sculpture and detail. The pediment was their sole concession to outline. The Romans went a stage further; they invented the circular plan, which soon led them to build domes. But they designed them to suit the interior without caring apparently how clumsy the exterior might appear. The first really conscious efforts to obtain good skyline are found in Constantinople, but whether this is the work of Romans or Turks I cannot say. The fleche appears to be the part of Hadrian's design; yet, on the other hand, the minarets adjoining the church look like later additions. These additions give much finish to the composition, and the height of the minarets counteracts the heaviness of the domes and semi-domes. This combination was perfected by the Turks in Cairo, where the minarets were made part of the church itself, and not merely adjuncts.

The Christian architects of the Middle Ages worked on entirely original lines. They made a belfry (or rather a bell-tower) an integral portion of their design, secondly, they allowed the exigencies of their construction to become manifest against the sky, and thirdly, they provided their buildings with roofs that were distinct from the vaulting. Perhaps the most important point is the second one; to counteract the thrust of the vault they built pinnacles and parapets, which gradually became the dominant features in the outline. In the later days of Gothic art the roof was entirely lost to view and the skyline resolved itself into rows of small pinnacles, above which soared the spire, itself but a pinnacle, of a larger and more elaborate character.

The Renaissance brought another change. As Mr. Bell says "the Cathedral of Florence and its unrivalled campanile are amongst the most lavishly ornate buildings in the world, but their enclosing lines are simple and severe Only on the summit of the vast dome does the almost universal instinct assert itself in a delicately designed lanthorn as FINISH."

At this period architecture completely changed its character. Throughout the Middle Ages it had been the handmaid of religion; it now became the servant of the people. The labour, the genius and the energy which had been lavishly devoted to the service of God, and to those who proudly claimed to be His earthly representatives, were diverted and made to minister to human wants and comforts. A new feature, infinitely more influential than the pinnacle, became universal. How the ancients warmed themselves, or indeed whether they ever were warm in winter, is a mystery to-day. We know that they had vast kitchen fires, we also know that, except where smelting works existed, the forests supplied fuel enough for the wants of the people. From the sixteenth century the use of the flue gradually spread downwards from the king's palace until to-day almost every room that is built is signalled above the roof by chimney and pot. In the course of centuries the architectural genius of the world has practically conquered the difficulties of grouping flues and ornamenting the stack containing them. Future ages have but one task left—that the crowning one—the chimney-pot.

First let me deal with the old adage, "a spire for a plain and a tower for a hill." It is an excellent piece of advice, but, like the old copy-book maxims, it does not go far enough and leaves the half untold. I should like to expand it thus: All buildings—and especially churches, which are generally isolated—are affected by their environment, and a contrast with their natural (and in a less degree with their artificial) surroundings is most likely to prove successful. Let me cite two instances. Have you ever rowed across one of the English lakes and noticed the old cottages and farm-houses that here and there border the banks? They are very squat and square, have no bay windows, the roofs are covered with large stone slates laid to a flat pitch, there is very little light and shade about them; and yet they look very well. Again, have you ever walked down Princes Street, Edinburgh, and noticed the happy effect of the National Gallery with its long low flat roof? In each case the success is due to contrast. The fells that cluster round the lake and the little promontories and tiny bays that make the shore provide a feast of varied beauty in which the farm-houses, through no effort of their own, are included. If their builders had had a little more ambition they would have tried to compete with Nature, and failed. Ruskin, who as a young man loved to lay down the law with many superlatives and much alliteration, ventures to assert that "a single villa will often mar a whole landscape and dethrone a dynasty of hills." In the second example mentioned the long roof of the gallery helps to emphasise the rugged grandeur of the castle and, on the other side, the height and gracetulness of the Scott Monument.

A tower, because it has a simpler outline than a spire, shows a greater advantage where Nature is bolder. A spire looks best standing by itself in a plain

*A paper read before the Manchester Society of Architects.

high above the tree tops and roofs. As a general rule, the eye in a flat country is grateful for every kind of landmark, towers and spires, windmills and trees. In Liverpool we have an excellent example of how even a factory chimney can give a focus to an otherwise dull landscape. The north end of the town, as seen from the river, presents a monotonous line of warehouse roofs rising steadily one above the other as they recede from the river—so monotonous that the Vauxhall chimney is a most welcome relief.

The value of a contrast in skyline is very curious, because the exact opposite is the rule with materials. Nothing looks worse in a rocky country than red bricks (except red tiles), and half-timber work is generally fatal where trees are rare.

My second theory is almost a corollary of the first. It is this: Where two or three long lines meet, it is well to emphasize the point of intersection. By long lines of course I mean such as are seen in perspective: the lines may be caused by the ground, by the walls, or by the roof. This is the reason why a finial helps nearly all gables, whether they have bargeboards or copings, why a fleche sits so nicely at the intersection of several roofs, and why a turret in the corner of a quadrangle appears so snug and appropriate.

But nowadays in ordinary practice we depend for our skyline almost entirely on chimneys. Partly because the use of cut and moulded brickwork has become so general, and partly because clients are now most outspoken about downdraughts, chimney stacks have of late years been growing in height. For efficiency and for economy they are best when built on the ridge; not on the eaves. For these reasons alone they would naturally appear to greater advantage. Chimneys rising direct from the eaves, unless attached by a gusset roof, to the main roof, look unnaturally thin and weak, especially if "supported" by an iron tie. The effect is much improved if on plan they project considerably. A good building can be spoilt in many ways by its chimneys. They can be too numerous, which suggests bad planning; they can clash with other features and make the outline confused; they can be too high, which makes them look extravagant and the rest of the building too small; and—perhaps what is the worst of all—they can be made too small, a fault which leads to those fearful objects known in the trade as patent cowls.

I have a few illustrations of most of these points. The Gothic mansion at Narrow Water exemplifies the reserve of my theory; there are no long lines in the view, therefore the architect worked on the principle that "many a mickle makes a muckle," and emphasized the intersection of all his lines; and to make matters worse he has made a special feature of every single flue. The result is a perfect jungle of pinnacles and turrets, chimneys and finials—an awful waste of money and an architectural failure.

The exact opposite is seen in the sketch of the Nunnery at Salford Priors. There is such an absence of chimneys as to give the house the appearance of being uninhabited. Perhaps the nuns have no fires; in any case, they must find their home rather chilly, as it is built on the principle "of Hardwick Hall, more glass than wall."

An almost perfect skyline, to my mind, is that of Fytton Manor House. If it has a fault it is that the main roofs do not mitre on the same level. The charm of the contour appears to arise from the happy distribution of the parts and not from the parts themselves. Each one leads upward and onward to the next. Even the conservatory seems to fit against the gable and help the length of the facade.

The cottage at the Godstow old bridge follows somewhat similar lines. A chimney marks each end of the ridge; on one side it is built in and almost hidden by a low gable, while on the side shown in the photograph the chimney boldly projects, and is buttressed by a hipped lean-to roof. The whole makes a very complete and satisfactory outline, which gains very greatly by being duplicated by reflection in the river. That is a point which should be borne in mind by anyone designing a building which will adjoin a sheltered piece of water.

A further instance of a chimney successfully completing a ridge is seen at the Hall at Balliol. The flues from the men's rooms adjoining are incorporated into the end wall of the hall, and serve to emphasise the point where the roof meets the coping—a point which would have appeared characterless without them, for no finial could have finished a gable of that size. The bareness of the other end is masked by a gable over the high table bay flinked by the chimneys from the kitchens.

The sense of bareness which Balliol avoids is very noticeable in the Rathhaus at Molsheim. The apex stones and finials on the gables are lost in the vast expanse of roof. The coping also is far too thin, the result being that this great roof, which from its very size should have been commanding, becomes featureless and disappointing.

My third point is the value of a complimentary feature. This is perhaps most noticeable in Classic work. Think of the great dome of St. Paul's and the two western towers: how much they help one another and assist us to estimate the size of the dome. The source of the harmony lies in their resemblance. We call one dome and the other tower; but they both have a domical outline and are unmistakably parts of the same building even when supervening roofs hide any connection between them. Without these western towers the cathedral would have sunk to the level of several well-known buildings, where the dome is everything and the church only the support.

A large round tower gains very much if a turret clings to its side. The French, especially about the year 1500, made a frequent use of this form. If a tower was unsuited to a turret, they always build a second tower near, as at Amboise and Azay-le-Rideau. In the Inglinger Thor Stendal we have another treatment. Here the circular tower does not sit very comfortably on the square base, but it would have been infinitely more out of place without the angle turrets.

Another example of a complimentary feature of a rather different kind can be seen in houses of the F plan—the plan in which a small gable with a slight projection is placed in the middle of the facade and a larger and deeper gable near the end. In an open site the F plan is much more likely to give a good outline than the E, of which the architects of Elizabeth's time were so fond. Yachting men may perhaps agree with me that a yawl looks more dainty and complete and even larger than a boat of the same size which has only one mast.

My last theory is that the vertical portion of an outline should be kept as subordinate as possible. Vertical features are of course, necessary, often constructional, but if possible they should not be prominent on the skyline. Nature provides us with an example in the stem of the larch tree, Scotch fir, and many others, but she generally contrives to batter the lowest portion and to conceal the upper. I have already pointed out how the conservatory at the Nunnery and the lean-to at the Godstow cottage complete the picture and provide a gradual finish at the base, which is almost as important as a definite feature at the apex. The base to Cæsar's Tower at Warwick Castle is almost double the size of the vertical portion. Mr. H. W. Brewer, in those wonderful architectural compositions which he has been publishing for the last thirty years, gives many instances of excellent skylines, but they are all of the upward and onward type: vertical features he has in plenty, but not against the horizon. Mont St. Michel, that grand personification of the church Militant, has hosts of towers and buttresses which rise sheer up to giddy heights, but with the exception of a small portion of the piers against the great Hall of the Knights, the sublime outline is not the result of high walling. The effect of too much vertical outline can be seen in the Palazzo Vecchio at Florence, a building whose tower fits on the main block like the shaft on to the handle of a T-square.

This is as far as my theories carry me. To recapitulate:—In order to obtain a good skyline, it is well to have a marked contrast with the natural and artificial surrounding; to emphasize the intersection of two or more long lines; to provide a complement to any strongly-marked feature; and to take care to keep the vertical portion of the outline as subordinate as possible to the inclined.

I endeavored to satisfy myself that a dormer should have a sharper pitch than the main roof on which it rests, but after some consideration I came to the conclusion that it depends on how much of the main roof is visible. The larger the roof the steeper the better. The dormers may follow the same slope or they may not; in either case they can fit very snugly, provided they are not too long. A very steep dormer which hides too much of the main roof is like a man with a big nose and a receding forehead. It seems to show an unnatural proportion, curious, perhaps, but not intellectual. We often see dormers of too large dimensions or too near adjoining dormers. That is another instance of failure in proportion. The castle at Hameln has four very large and elaborate dormers which can just find room to balance on the eaves without elbowing each other off. The main roof is quite lost, with the result that the skyline becomes as crowded with large features as that of Narrow Water is with the chimneys and pinnacles.

I remember hearing a story that a pupil once asked Mr. Norman Shaw what pitch he should make a dormer. Mr. Shaw sketched the dormer in freehand. The pupil measured it and finding that the angle was 51 deg. delighted Mr. Shaw by telling him that it was exactly the same as the Pyramids. The angle of the Pyramids is generally considered to be the acme of perfection—for a pyramid; but it was a mere coincidence that Mr. Norman Shaw's dormer should have the same angle.

One of the blessings for which we have to thank the Gothic revivalists is the reintroduction of the gable. The eighteenth century was all for cornice and coping and a featureless skyline. Pediment is all very well when seen in full elevation, but as to suit that point of view the pitch needs to be very low, the effect is lost in acute perspective. So enamoured however were our great-grandfathers with this flatness that it is very doubtful whether there exists a gable that is more than sixty and less than a hundred years old. So many English towns were rebuilt during the age of the hip and coping that I hardly know an English street of gables, although before Queen Anne lived and died the continuous row was invariably the rule. We have a good many in Chester, but not a street full of gables. The streets in some old German towns show what we have lost. No form of roof can give such an endless play of light and shade, such variety of outline, and yet preserve the identity of every building. The market place at Munster contains a large sprinkling of sixteenth and seventeenth century gables, but chiefly where expense is not the first consideration. The excellence of large Welsh slates as a covering for roofs of 30 deg. tends to maintain to-day the fashions of eighty years ago. On the other hand, in the thousands of little villas—single and semi-detached—which, like mushrooms, spring up in the suburbs, gables, hosts of little gables, can be seen, but hardly ever a large one. A large gable requires to be carefully designed; the small ones only can follow the stock pattern.

I find that Mr. Statham, in his book on modern architecture, comes to the exact opposite conclusion with regard to a street full of gables. He declares that our modern examples are only designed by architects who make a fetish of their skyline; he warns us that there is a risk in the long gutters between adjoining buildings, and adds that the attics under longitudinal ridges are much more uncomfortable than those under cross gables. He ends by recommending flat roofs on town buildings and obtaining a skyline by building some blocks higher than others. A skyline composed of square lumps can look extremely well. I do not think that anyone would deny that who has sailed up New York harbour and seen from three miles or so—not less—the grouping of the sky-scrapers; but to see a row of square lumps every time you look along the street is quite another matter, and surely it is just as difficult to construct a flat roof as a gutter, and the flat roof is more costly, at any rate in the City of Liverpool, where the Health Committee have decided that such a roof is an outside wall within the meaning of the Act, and must therefore be constructed of brick, stone, or other incombustible material.

The superstition that uniformity is the perfection of architecture still lingers to spoil many a skyline. The fallacy is manifest. A building canonly appear uniform from one particular point of view; if that point is the only one, or if the great majority of people can be induced to view it from there, then uniformity becomes ideal. Vanbrugh carried the principle to its logical conclusion in the great carriage-drives which lead up to his country houses. Some of our public buildings, and many abroad, have a large place in front and converging streets beyond it. Under such conditions uniformity can be seen to proper advantage. But on a site with a greater width than the open space in front, or on one approached sideways or diagonally by a principal thoroughfare, uniformity often leads to disaster. One half of the building blocks the view of the other half, the balance of parts is lost or distorted, and features become prominent (such as the roof behind the pediment) to which little or no attention has been given. If more thought were given to large

buildings they could be designed to look their best from the points from which they are most often seen. The tower at the Brussels Law Courts, although by itself most majestic and monumental, appears foreshortened and narrow from the square opposite the main entrance, and cannot be properly seen from any point within a mile. It looks its best from the rising ground two or three miles beyond the lower tower. Considering these circumstances we may fairly ask, was the tower worth the great cost?

Let me close with a sentence from Mr. Ingress Bell: "In a building the skyline is the most important line, for the relief of solid against solid cannot be so sharply defined as the relief of solid against vacancy, and play of light and shade, which we can give to our facades, is as nothing to the contrast of their dark margins with clear air above."

MUNICIPAL IMPROVEMENTS.

The Toronto Guild of Civic Art recently extended an invitation to the different organizations in Toronto which are more or less interested in the subject, to attend a meeting to consider several propositions looking to the general improvement of the city by means of parks, squares, well designed buildings, etc. The meeting was held on the evening of the 21st inst., in the Board of Trade Building, and was attended by representatives from the Ontario Society of Artists; The Ontario Association of Architects; The Canadian Institute; The Toronto Architectural Eighteen Club; The Public School Art League; The Engineers' Club; The Toronto Board of Trade; The Bankers' Association (Toronto Branch): The Canadian Manufacturers' Association (Toronto Branch); The Civic Victorian Memorial Committee.

The following propositions were discussed:—

(1) The appropriate decoration of part of the city on the occasion of the visit of H.R.H. the Duke of Cornwall and York. (2) The purchase by the city of some central park squares. (3) The general improvement of the city by Drives, Parks, Boulevards, etc., and (4) To make representations to the Provincial Government, as to the design and character of the proposed new University Buildings.

The result of the meeting is embodied in the following resolution which was adopted unanimously:—

Moved by B. E. Walker, seconded by Prof. Mavor, "That a Committee be appointed to urge on the City Council the wisdom of conferring with the Guild of Civic Art as to a plan for the general improvement of the City by parks, central squares, drives, boulevards, and other means, such plan to be adopted for the future guidance of the Board of Public Works, and that the Committee shall consist of the delegates appointed by the different organizations to this meeting with power to add to their number."

LEGAL.

The Court of Appeals of the United States has recently put on record the opinion that "an owner who employs a competent architect to prepare plans for a building and lets the work of construction to a competent independent contractor, is not liable for injury to an employee upon the work from the falling of the building while in process of construction, caused by a foreman's negligence in departing from the plans."

A combination of the leading stained glass manufacturers of the United States, is proposed to be capitalised at $5,000,000 the object being to bring the stained-glass manufacturers under a single management, eliminate competition in selling, and reduce the cost of manufacture.

SUGGESTED COMPETITION FOR SCHOOL OF SCIENCE.

The committee of the Ontario Association of Architects appointed to consult with the Minister of Education with reference to the proposed new Science Building in Toronto, had an interview with the Minister and also at his suggestion with the Commissioner of Public Works. Both gentlemen very courteously received the committee. The suggestion offered was the procedure which has been frequently followed both in Great Britain and the United States. When a public building of considerable size and importance is to be erected it is generally conceded that an effort should be made to obtain a design worthy of the occasion. Some method of competition, in fairness to all, seems necessary.

The committee suggested that, in order to secure designs by at least some architects of established ability and reputation, a limited number of such architects be invited to compete, each of whom should receive a certain suitable fee. The selection of these, say four or six in number, might be made equally by the government and the O.A.A. In addition to these appointed competitors, the competition to be thrown open to the profession in Canada. The designs to be judged by a board of say three assessors, composed of Principal Galbraith, the Provincial Architect and a third who might be nominated by the Ontario Association of Architects. This board to draw up the terms of the competition and the general requirements of the scheme.

The committee referred to several important competitions conducted on lines similar to those above outlined with excellent results, and hoped that the department would see their way to adopt some such method of procedure in the present case.

THE COLONIAL BUILDING AT PARIS.

An interesting discussion took place recently in the Dominion Parliament in connection with an item of $90,000 which Canada is called upon to pay towards the cost of the Colonial building at the Paris Exhibition. It was agreed on all sides that the cost of the building was entirely out of proportion to its character. The Minister of Public Works stated that it had to be strengthened, the roof made tight, and the exterior decorated to give it a presentable appearance. The government, while admitting that we had been "taken in," explained that the building was erected entirely under the direction of the Imperial authorities and that if Canada had not accepted the proposal made for space in the building she would have been debarred from taking part in the Exhibition.

CANADIAN SOCIETY OF CIVIL ENGINEERS.

The Canadian Society of Civil Engineers have arranged to have an excursion to Buffalo in June. The proposal is that the members who may attend will spend a week in seeing the objects of interest in the city and at the Exhibition. The name of Mr. Collingwood Schrieber, Deputy Minister of Railways and Canals, Ottawa, is mentioned in connection with the Presidency of the society next year.

The committee appointed to obtain designs for a statue to Governor Simcoe have chosen the one submitted by Mr. Walter S. Allwood, of Toronto. The statue will be cast in bronze and will be erected under the supervision of the Toronto Guild of Civic Art, in front of the Legislative Buildings, in Queen's Park.

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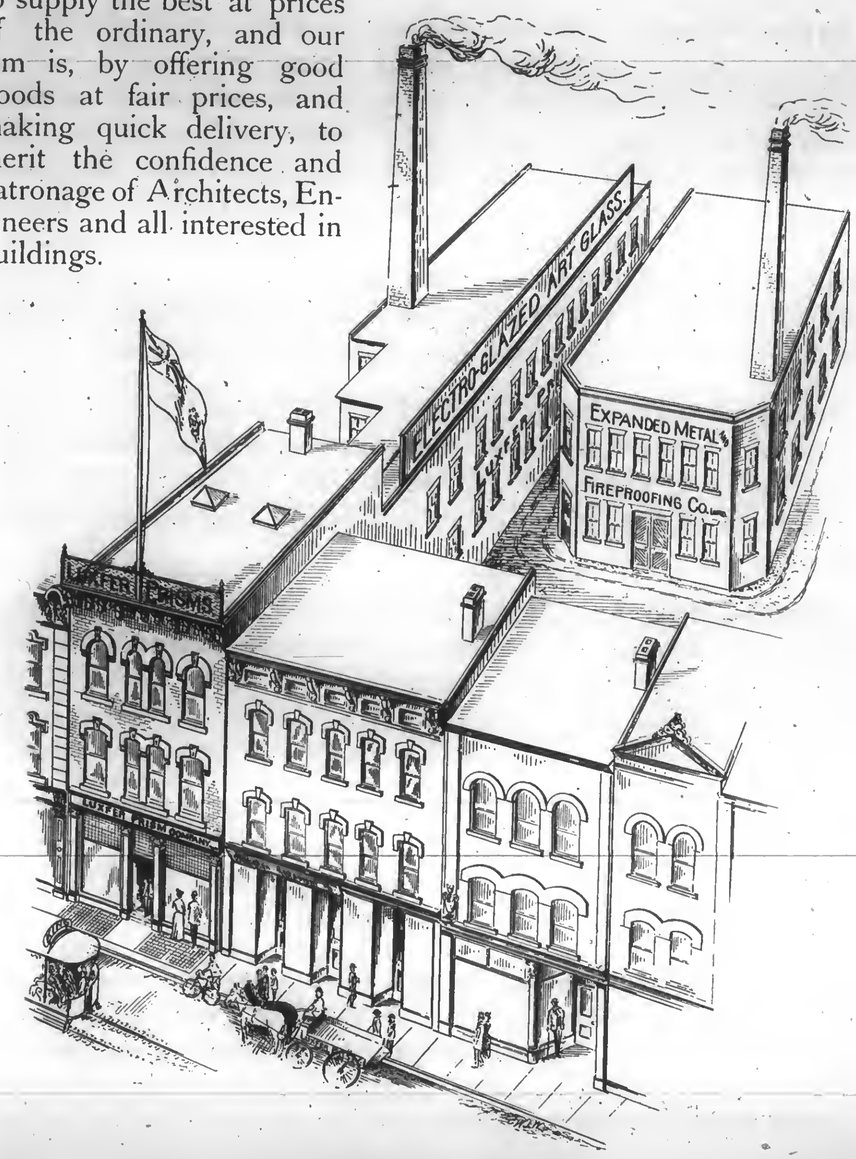

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J. and C. Low, contractors and builders, of Ottawa, were defendants in an interesting action, in which judgment has been given. Defendants had the contract to build a summer cottage on Rabbit Island in the St. Lawrence last summer. They sub-let the contract for plumbing to King & Burnette, of Lansdowne, for $500. The cottage was destroyed by fire when almost completed. The sub-contractor sued the contractors for $488, claiming that amount of work was done when the cottage was destroyed. They were allowed this amount by the Jury at the Brockville Assizes. Chancellor Boyd reserved judgment on a legal point raised by defendants' counsel. He however, gave judgment in favor of plaintiff.

WHERE DOES A BUILDING BEGIN?—An exceedingly novel point under the Workmen's Compensation Act was raised before Judge Parry at Manchester County Court. Christopher M'Grath, while bricksetting on a warehouse that was being erected by Messrs. Neill and Sons, was thrown from the second story to the basement by a plank suddenly tilting up. He therefore claimed damages for injuries sustained. The question at issue was one as to whether the height of the building should be calculated from the street level or from the level of the cellar. It was argued that if the street level were to be taken the 30 feet required by the Act would not be obtained, and the action could not succeed. Judge Parry expressed his opinion that the only way of measuring was to begin at the bottom of the brick, inasmuch as a builder began at the bottom, whether it was above or below the street level. As the point, however, was a very important one, he would reserve his decision.

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MANITOBA CORRESPONDENCE.

(Continued from page 104.)

to each set of rooms leading from the main entrance hall, so that when the hall door is closed the suite is quite shut off from the rest of the building. The question of good ventilation and plenty of sunlight are matters which the designers of such buildings should well consider. Disease may lurk more in structures of this kind than in private houses il the question of sanitation, light and air is not well considered and provided for in the construction.

An attempt was made some time ago to form an architectural association here but for one cause or another it fell through. An association of this kind is much needed and might be made very useful. We can all learn very much from one another and a general rubbing up of ideas at monthly or other meetings would do any of us good and add much to our usefulness. One thing we might consider is that there should be some standard by which any one desiring to practice as an architect could or should be measured.

Some contractors are in the habit of drawing sketches or getting plans and then offering to put up the buildings. This is a bad practice, and as a rule it leads to a poor class of buildings (architecturally speaking) being erected, and is a loss to the legitimate architect who would be commissioned in most cases to prepare the plans and superintend the work. We have known cases where buildings designed by an architect have been almost duplicated in the way referred to. Imitation may be the sincerest form of flattery, but it is not a paying thing for the architect, nor is it fair or right.

It seems a very difficult matter to get the architectural profession placed on a proper basis. The members of other professions such as Lawyers, Doctors, Dentists, etc., are allowed to protect themselves and the public, while architects get no protection or legalized standing. Combines seem the order of the day but an architectural combine seems to be out of the question up here, for the present at any rate.

The Parks Board have taken charge of the City Hall square and are planting extra trees and intend to lay out flower beds. This is a move in the right direction. They have also charge of all boulevarding in the city and will plant trees on a definite plan, charging the cost up to the owners. This will beautify and improve our streets, as trees add much to the appearance of street architecture.

NOTES.

The foundation for J. G. Hargrave & Co's store on Main st. is well under way.

Progress is being made with the foundation of the new Merchants' Bank building and some good work is being done.

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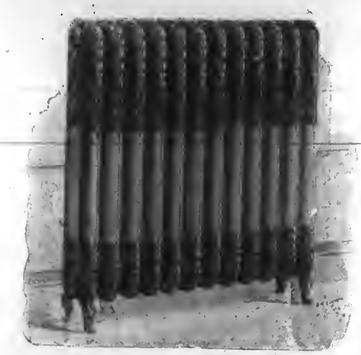

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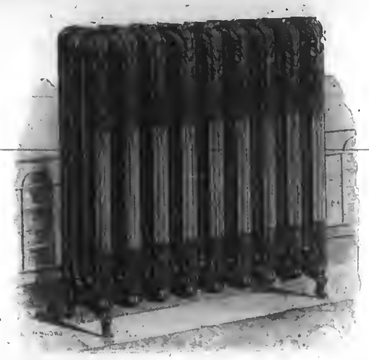

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CATALOGUE FOR THE ASKING

BUILDING IN CHICAGO.

The Chicago Building Contractors' Council, which recently cast off the yoke of the Building Trades Council, celebrated the victory by holding a banquet. Since the deadlock in the building trades in Chicago was broken, building activity has been so great that supply firms are finding it difficult to meet the demand for certain kinds of materials.

A dispatch from London states that a few weeks ago a small marble shaft fell from one of the windows in St. Andrew's Chapel, in Westminster Abbey, the iron pin that had sustained it for 600 years having become corroded. Iron pins are doing the same duty in innumerable places throughout the Abbey and further dilapidation is apprehended. To overhaul and renew these pins would be a superhuman labor. Professor Church says that the use of gas as an illuminant in the Abbey, which is a limestone building, sets up a chemical change which is followed by disintegration. It has been suggested as a means of checking further decay that the Abbey be lighted by electricity, as is St Peter's at Rome.

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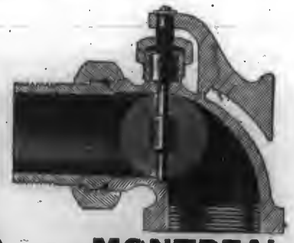

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PERSONAL.

The sons of the late Thos. Haskins, who was for many years city engineer of Hamilton, have recently had erected a memorial window in St. Thomas Church.

Mr. Thos. C. Sorby, architect, of Vancouver, B.C., is writing a series of articles on "Domestic Architecture in England During the Middle Ages," for the American Architect.

Mr. W. H. Law, late chief engineer of the Hamilton Bridge Company, has been placed in charge of the structural iron department of the Canada Foundry Company, Toronto.

Mr. J. O. Marchand, of Montreal, who has just completed a course of study in architecture at the Ecole des Beaux Arts, Paris, has distinguished himself by winning a competition in design over the heads of 400 rivals of all nationalities. He has been awarded a first-class medal, and his work has been purchased for the library of the school.

Mr. Henry B. Gordon, of the firm of Gordon & Helliwell, architects, of Toronto, has gone to Corea, having received a commission from the King, to supervise the erection of a new palace, hospital and other important buildings. He expects to be absent at least a year. Previous to his departure his many friends tendered him a complimentary banquet at McConkey's and presented him with an illuminated address.

Mr. G. F. Todd, landscape architect, of Montreal, spent a few days in Toronto recently, and was a guest at the weekly luncheon of the Ontario Association of Architects. He had also an interview with the Mayor regarding the improvement of the Industrial Exhibition grounds on the lines suggested by the O. A. A., and the laying out of central squares, and such like methods of improving the appearance of the city.

An English paper states that Mr. Edwin O. Sachs, the architect under whose direction a series of valuable tests of fire proofing materials is being conducted in London, is not yet thirty years of age, but has already started four times at the lowest rung of the ladder—not as a necessity, but as a means of instruction. As an architect, he started by working as a bricklayer for four months. As an engineer, he worked in the smithy. To understand stage construction he became sceneshifter at half-a-crown a night for four hours' labour; and, lastly, to learn everything connected with fire and its prevention, Mr. Sachs joined a fire brigade for six months in Vienna, afterwards serving in Berlin.

SASH CORD.

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Mr. W. F. Tallman, who for some years was engaged with his father, in the manufacture of brick, at Beamsville, Ont., has gone to Edmonton, N.W.T., to assume the management of a brick-making plant about to be put into operation there by Messrs. P. Anderson & Company. It is expected that the plant will commence operations this month. It will be located between Strathcona and Edmonton, on a line of railway now surveyed. The plant will be quite extensive, having a capacity of 50,000 bricks per day, and although there are three other plants in the town, it is anticipated that all the brick manufactured by the different plants will be required for construction in Edmonton and vicinity. No stone is procurable within a distance of one hundred miles, and as a result brick is used for foundation purposes. In the town of Edmonton alone it is estimated that 4,000,000 bricks will be used this year. It is probable that, in addition to common brick, the company will manufacture sewer pipe, sidewalk brick, and if the clay should be found suitable, pressed brick also. In Mr. Tallman, the company have secured a manager whose ability and experience warrants the prediction of successful operations.

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BLAIS VS. THE GURNEY-MASSEY CO.—This case came up before Justices Gill, Mathieu and Loranger of the Court of Review, Montreal, on the 9th inst. The defendant inscribed in review from a judgment which maintained the plaintiff's action and condemned the defendant to pay $400 damages. The case arose out of the purchase by the plaintiff from the defendant, in the fall of 1899, of a steam-heating apparatus, styled in the defendant's catalogue, "Gurney's Bright Idea Water Tube Steam Boiler." The plaintiff had entered into a contract with the Fabrique of the parish of Ste. Martine, district of Beauharnois, for the installment of a heating apparatus, to heat the parish church. The defendant published a catalogue in 1897 in which the particular apparatus purchased by the plaintiff was represented as having a heating capacity of 2,400 square feet of radiating surface, equivalent, as appeared by the evidence of experts, to 7,200 linear feet of one-inch pipe, the price of which was $686. In 1899 the defendant published another catalogue, in which it appeared that the heating capacity of this apparatus was reduced to 1,800 square feet, equivalent to 5,400 linear feet, and the price was reduced to $600. After the apparatus was installed it was found that it would not heat the pipes and the rest of the system with which it was connected. The plaintiff protested the company defendant, and called upon it to replace the apparatus with one of a capacity of 7,200 linear feet, as stated in the catalogue of 1896. The defendant refused to do this, alleging that it sold the apparatus according to the catalogue of 1899, wherein the capacity was guaranteed to be only 1800 square feet; that the apparatus had that capacity, and if it did not heat the pipes of the church sufficiently, it was owing to their too grea extent. The court below decided in favor of plaintiff's pretension as to the catalogue, but rejected his claim for damages to reputation, and reduced his demand of $647, for replacing the heating apparatus, to $400, and this award appearing to the Court of Review to be well founded, the judgment was confirmed.

A prominent insurance adjuster makes the statement, that a large majority of the recent fires in the city of New York have resulted from imperfectly insulated electric wires. He says that this is due to the fact that the contractors for electric wiring employ boys and inexperienced men to do the work, rather than be obliged to pay for the services ot experienced electricians, and that the vibration and settlement of walls frequently destroy the insulation where proper preventives have not been employed. He adds: "It, therefore, behooves architects to specify that none but thoroughly competent and experienced workmen shall be employed, and they must not trust entirely to the electrical contractor, but examine the work themselves with the same exacting care that they devote to work done by other builders."

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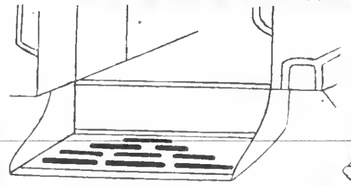

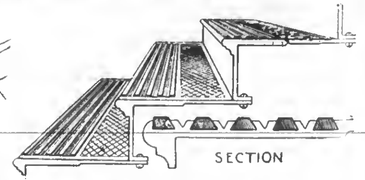

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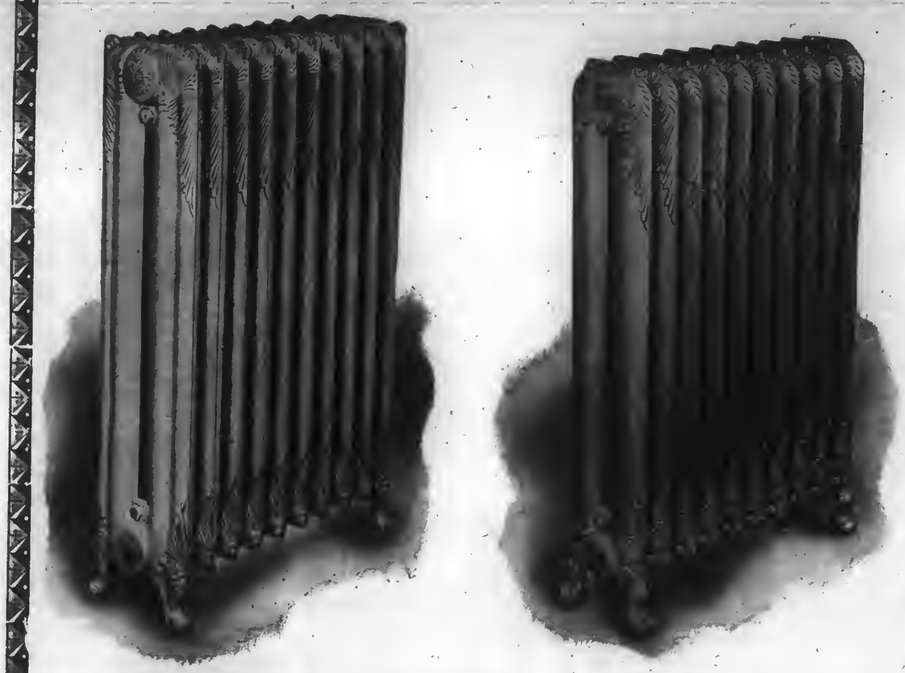

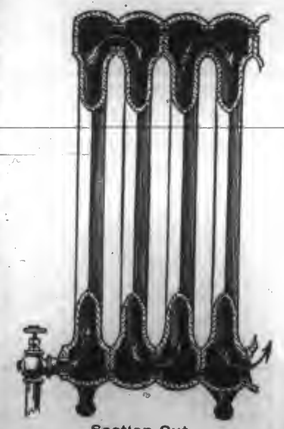

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LETTER FROM THE TORONTO ARCHITECTURAL EIGHTEEN CLUB.

Publishers CANADIAN ARCHITECT AND BUILDER:

DEAR SIRS:—We received your communication of the 8th ult., informing us that a certain local architect and some others have strongly objected to one illustration page of your journal being reserved for our Club, with that fact printed on said reserved page, as has been the case for some months past; and further that if such "distinction thus given to us be not removed, they will in future decline to give" you "drawings and photographs of their work for reproduction."

We beg to say that our idea in introducing this innovation was that our Club would be enabled thereby to exercise strict censorship over the published work of its members, and, at the same time endeavor to create a friendly rivalry in the quality of their published work and that published by the rest of the architectural profession of Canada—a result we considered beneficial, at once to our country, your journal and the profession at large.

That through your enterprise we have succeeded by means of our reserved page in bringing an increased measure of favorable notice to the work published on your illustration pages is amply proven by turning to the critical pages of the Architectural Review published in Boston, from the pen of one of the foremost architectural critics on this side of the Atlantic.

We had not the remotest idea, till we received your letter that anyone imagined that our members had secured undue distinction beyond their fellows. Therefore we desire to relieve you, as suggested, "From the unpleasant situation in which" you "find" yourselves "placed through circumstances over which" you "have no control." We would keep no impediment in the way of this gentleman and his friends; we wish them to supply you with their photographs and drawings for reproduction. Therefore we cheerfully accede to their request that we be treated as other architects contributing to the illustration pages of your journal. But we think we will not avail ourselves of their liberal offer, viz., that when, in future, any of our members may, individually, as all architects contributing to your pages, send you drawings for reproduction, they shall have the privilege of announcing on the page that they are members of the Eighteen Club.

But some matters must not be taken too seriously. Some of us remember how in our student days amusing stories were told us how the "old fellows" of the then "old days" would allow nothing architectual to be done, no matter how excellent, unless something in the shape of precedent could be hunted up to warrant its adoption. Happily those days of architectural practice have long since gone by, though apparently some vestige of the principle remains in the minds of our esteemed contemporaries as you quote them in your letter as objecting to our reserved page on the ground that "There can be found no precedent" for it "among the architectural journals of other countries."

In conclusion we specially request this letter to be printed in full in your next issue as we think it only fair to our Club that your readers should know the reason of the non appearance of our former reserved illustration page.

Yours truly,
J. P. HYNES,
Sec. pro. tem.

TO INTENSIFY BLUE PRINTS.

In a recent issue of the Photographisches Wochenblatt is an article advocating the use of peroxide of hydrogen for giving greater intensity of color to blue prints. It will be remembered that a blue print is not as intense on leaving the washing water as it is after some 24 hours' exposure to air, an effect assigned to oxidation. To remedy this, it is suggested that a few drops of peroxide of hydrogen be added to the water, to increase the rate of oxidation. The scheme is also useful when the paper is old and gives veiled prints. In case the sensitized paper has turned a greenish blue, it should be over printed until a decided image is visible. Then a little washing soda solution should be added to the washing water, but it should be used sparingly. The washing should be repeated until the whites are clear, and then the prints should be given a final wash in water to which a small quantity of peroxide of hydrogen has been added.

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INTERIOR OF CHAPEL, LORETTO ABBEY, TORONTO.
BEAUMONT JARVIS, ARCHITECT.

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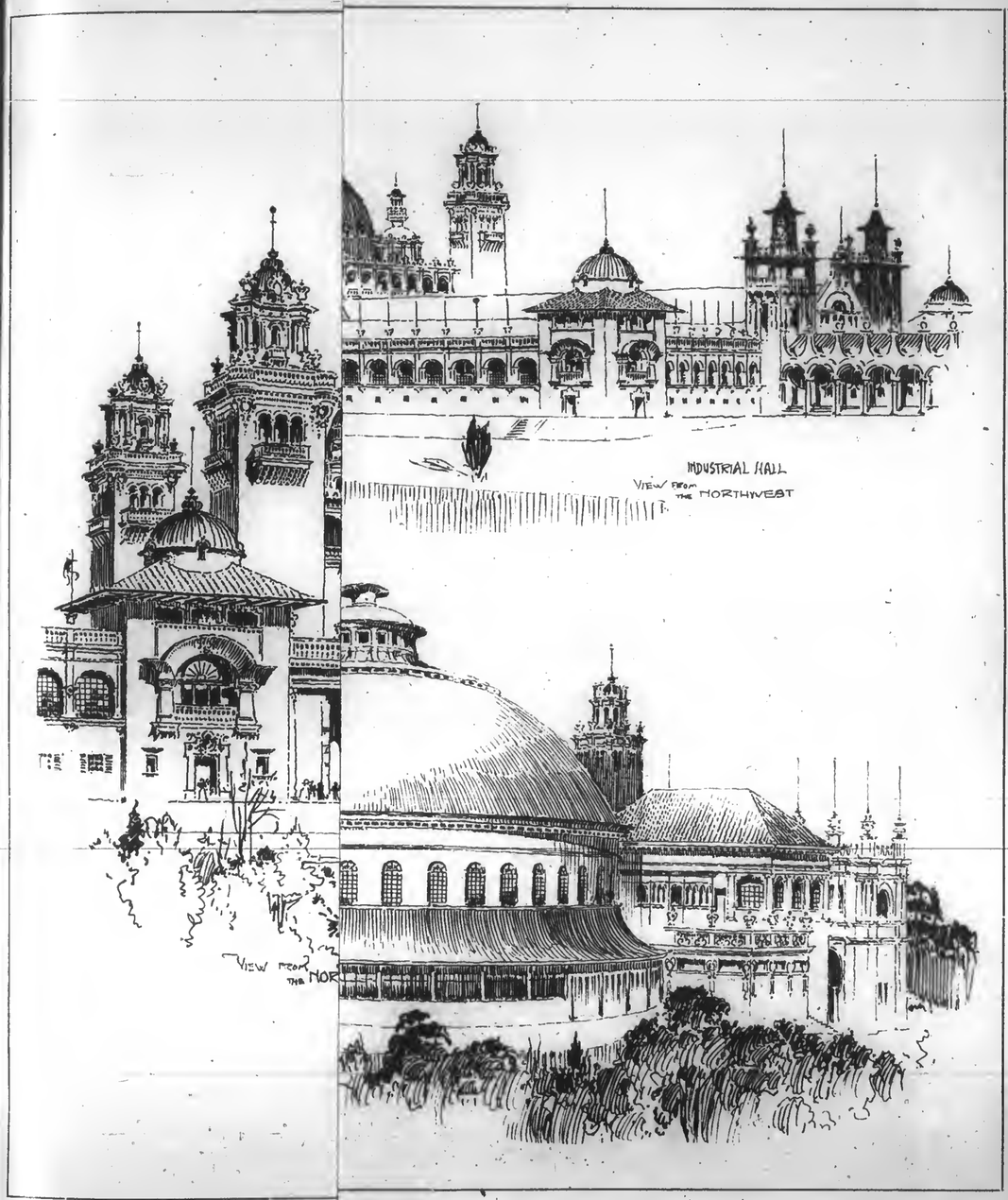
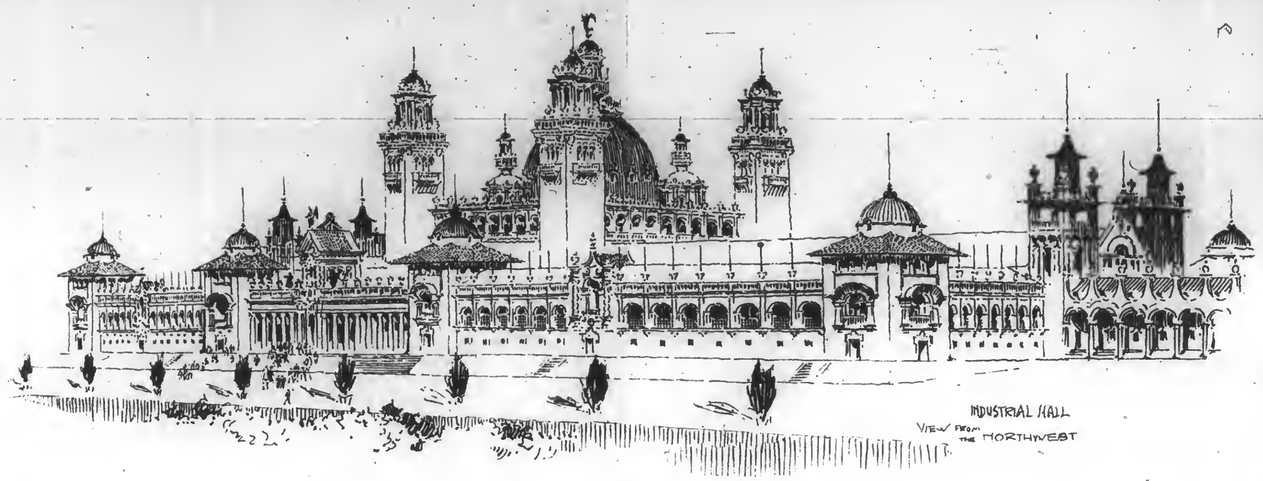
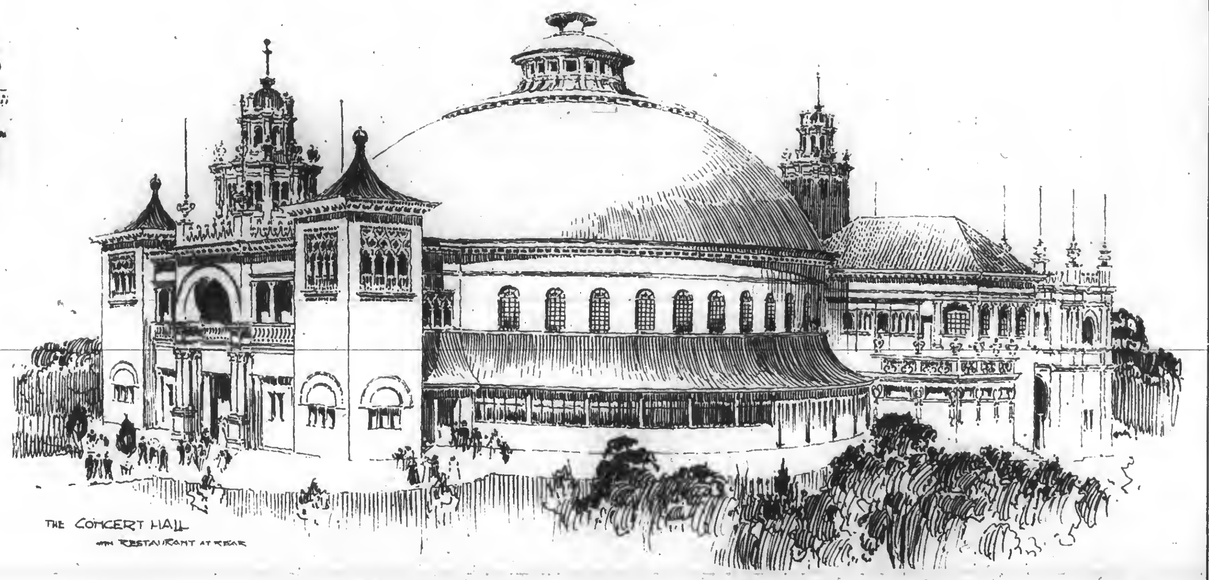


INDUSTRIAL HALL
VIEW FROM THE NORTHWEST

GIBBON.





THE GLASGOW EXHIBITION BUILDINGS.—From Sketches for "The Builder," by Mr. A. McGibbon.

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BRANCH OF THE CANADIAN BANK OF COMMERCE, BLOOR AND YONGE STREETS, TORONTO, ONT.

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SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
MAY, 1901.

The Canadian Architect and Builder

VOL. XIV.—NO. 162. JUNE, 1901.

ILLUSTRATIONS ON SHEETS.

Plan and Section Proposed "Salle Des Fetes,"—W. S. Maxwell, Architect.
Design for Residence in British Columbia—R. M. Fripp, F.R.I.B.A., Architect.

ILLUSTRATIONS IN TEXT.

Small Suburban Houses—(Illustrations accompanying Paper by Mr. Searles-Wood before the London Architectural Association.)
Canadian and Russian Pavilions, Glasgow Exhibition.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Two Photogravure Plates—Proposed "Salle Des Fetes,"—W. S. Maxwell, Architect.

CONTENTS.

Editorial	113-14-15	Suggestions for Decorators and Furnishers	124
Decoration Methods and Materials	116-117	An Effort to Secure Uniformity in the Size of Bricks	125
Montreal Correspondence	119	Manufactures and Materials	127
Brick Immersion Tests	119	Legal	129
Accidents to Reservoir Dams	120	Building Conditions	132
Classification of Romanesque Architecture	121-122	Relative Value of Fire Resisting Materials	132
Students' Department	123-124		

SPECIAL CONTRIBUTORS.

PROF. S. H. CAPPER, R.C.A., Department of Architecture, McGill University, Montreal.
MR. W. A. LANGTON, Architect, Toronto.
" EDMUND BURKE, " "
" S. H. TOWNSEND, " "
" FREDERICK G. TODD, Landscape Architect, Montreal.
" R. A. L. GRAY, Electrical Engineer, Toronto.
" W. H. ELLIOTT, of Messrs. Elliott & Son Co., Toronto.
" J. C. B. HORWOOD, Architect, Toronto.
" A. F. DUNLOP, R.C.A., Architect, Montreal.

The Evil of Strikes.

As the result of a lengthened strike of Belgian glass workers, for a greater increase of wages than the manufacturers could afford to pay, the trade of these manufacturers has gone to other countries, a once prosperous industry has been lost to Belgium, and ruin has come to those whose means were invested in it. The competition engendered by the emigration of large numbers of the strikers to the United States, is said to threaten the life of the window glass trust in that country.

The Proposed Art Gallery in Toronto.

It was announced not long ago that $30,000 for this building was in sight, leaving only $20,000 to raise to make half the cost of the building; and it was contended that, when the half was raised by voluntary contribution, the city ought to supply the rest. This is a reasonable proposition, and it suggests the possibility of the whole scheme being put through in time for the Duke of Cornwall and York to lay the corner stone. The city's subscription, once agreed upon, is but the stroke of a pen. It is only the $20,000 of voluntary subscription that need take any time, and it need not take much time. It is not hard to find in the city of Toronto one man who is able to give $20,000, nor two who can give $10,000, nor four who can give $5,000, nor even twenty who can give $1,000. There is hope for the accomplishment of such a purpose as getting the memorial to Queen Victoria advanced far enough for her grandson, and our future King, to lay the corner stone. The fashion of giving has not been in vogue among the original rich of Toronto. Perhaps it was not so much their fault as the fault of their times. Rich men had not discovered what is now being discovered, that one of the blessings of wealth is the power to give. Can there be a greater enjoyment of wealth than the power to say that there shall be an Art Museum in Toronto? Several gentlemen have already decided to say this, with an emphasis proportioned to their means; and if the committee, who have the project in hand want to get a sub-committee who will put the matter forcibly before other gentlemen of means, we would suggest that they ask the present subscribers to form such a sub-committee. They have a right to ask others to subscribe; and will be able to persuade others to taste what, if one may judge from recent examples, is the latest enjoyment of rich men—the pleasure of giving.

Re Beautifying Toronto.

The Toronto Guild of Civic Art has been trying to move the civic authorities in the direction of an improved plan of the city, towards which all extensions and improvements may work; so that every piece of work undertaken in the way of laying out new streets in the suburbs, or opening up new streets in the old part of the city, may tend towards the accomplishment of a definite scheme which will make Toronto a fine city.

It was well contended by the deputation from the Guild that this was a matter beyond the scope of volunteer advice such as the Association of Architects have offered in the minor matters of rearranging the fair grounds or preserving an ornamental water front in the centre of the city. The Mayor's reply that, if a plan which would cost money was necessary, the Guild of Civic Art ought to collect half the sum necessary for it, was probably the most practical politics, though, abstractly, the work is eminently a public work, and is only an expense in the first instance; for it would undoubtedly in the end save many times its cost.

Economy was the word with the Board of Control. Let us then point out a civic improvement that would be a saving; which at least would have been a saving if nothing had yet been done, but now involves the slight expense of some uprooting, for it is the uprooting of what has been planted that constitutes the improvement we would suggest. Somebody has conceived the idea of spotting the Queen's Park over with little conical evergreens. Whether these remain dwarfs or grow to any considerable size, the Park is in either case spoiled; and it is difficult to understand how any official, of sufficient attainments to be in a position of authority in this department of the city, could not see how totally at variance these plantings are with the character of Queen's Park. The history of the Queen's Park is probably that of most of the parks which are adjacent to the country seat of an English landed family. It was originally set apart for pasture land, and trees have been allowed to grow up sufficient for shade without being so close as to spoil the grass. The resulting character of sweeping lines of grass, harmonizing with the spreading growth of trees which stand alone or in groups, constitutes to English people the idea of a park; and that sort of park we had in greater perfection than many an English nobleman, until this bush planter came along and intercepted every vista under the trees by his little stiff cones of fir, so that the eye can no longer follow the long sweeps of surface which were the characteristic beauty of the park.

Doubtless the idea comes from the new American parks, in which a garden style is adopted as the only thing available until trees can be grown. To imitate this at all is only excusable under the same conditions, and one may expect from the committee of parks and gardens not only a perception that the two styles cannot be mixed, but a perception that the style of the Queen's Park is much the finer. It is only an understanding of the ground of beauty in the Queen's Park that can preserve it not only from this danger but from a danger which continually threatens, of tampering with the ravines so as to spoil the slopes which are so essential to the beauty of the park. Trees on a slope have always made a favorite theme for painters, and, whatever happens to the bottom of the ravines, it ought to be well understood that the grassy slopes must be preserved.

The New S.P.S. Building.

The Guild of Civic Art is also taking a hand in the effort to have the new School of Practical Science Building made worthy of the city. It is supported by representatives from most of the important public bodies in Toronto, who have united with the Guild to form a special committee for this purpose. An interview with the Premier has been arranged, but so late in the month that it is probable the Premier's answer will be— with much regret— that it is too late to do anything. It is understood that the Provincial Architect's office is already engaged upon plans of the building. It is now or never that the case of this building must be pressed. The Premier and the Minister of Education have both spoken in such a way as to lead to the belief that they wish to have this building well designed, and are disposed to regard favourably a liberal policy in regard to the appointment of an architect. That liberal policy which will be most effectual is to be found in practice in the United States, where private architects of repute are employed for the erection of public buildings. The Minister of Public Works, who seems to think his department is being "passed over" unless the provincial architect is not only the supervisor but the designer of the new building, will find, if he enquires about the present method in the United States, that there is no occasion for such a feeling. The Federal architect and the State architects still exist and have plenty to do, but, though it is such a short time ago since the struggle arose with these departments—the same struggle as is taking place over the School of Practical Science Building— to have important buildings put in the hands of architects in private practice, the question is completely settled, settled on its merits. Public opinion and official opinion are at one in the matter. Indeed, so settled has the idea become that this is the only way to procure good public buildings, that the government is now quite as anxious as architects or the public not to lapse into the old way of doing things. Some misunderstandings have arisen, the American Architect says, in applying the bill under which treasury work is given out to competition of invited architects, and some of the most eminent architects in the country have declined invitations to compete for government work. In consequence of this, the Secretary of the Treasury has been conferring with the President of the American Institute of Architects, in order to remove the conditions which have led to misunderstanding. It is evident that the Secretary of the Treasury agrees with the American Architect that "the refusal of the best architects to enter into government competitions would be a public misfortune." This is after experience of the working of this method, which had when first proposed to encounter the identical opposition which, if we may judge from his words, it is encountering now in the mind of the Hon. Minister of Public Works in Ontario. It is for this reason that we recommend to him to make enquiries about the American method of proceeding, and we think he will find that he will pursue a course most to the credit of his department if he requests the public architect to utilize the study he has so far made of the subject, and the special information he will acquire on his trip with Professor Galbraith, to draw up a full statement of the requirements and conditions of a properly arranged building for the school, and to act afterwards as one of the expert arbitrators to judge the results of either a limited competition or an open competition.

We are reminded by this Ontario situation, of a motion that was made in the convention of the Ontario Association of Architects, to memorialize the Dominion Government upon this same subject of appointing private architects to design public buildings, or giving the buildings out to competition. The question was referred to the council to act upon as they should see fit. The council appear to have seen fit not to act upon it, but it is a question whether this was what the convention intended.

New German Schedule of Fees

A new schedule of fees has been adopted in Germany, which affords interesting study. In the first place, it is adopted not only by the architectural societies, but by engineers, constructive, heating, gas, water, electrical and mechanical, who appear to be united in one association with the architects. Fees are determined upon principles common to all the associated professions. Specialties have special sections. The liberality of the principles upon which fees are computed is worth studying. In the matter of preliminary studies, a large view is taken of the importance of this part of the work, and more intelligent provision is made for proper payment than a hard and fast rule of 1 per cent. Where a commission embraces several structures of the same design, to be executed simultaneously, the fee is reckoned for supervision upon the whole cost, which is natural, and for other services according to the work done, which is also fair; but preliminary studies too get consideration on the basis of total cost. When a commission consists solely of the preliminary sketches, the fee is to be increased one-half. Where preliminary sketches, agreeing with different programmes, are desired, each is considered independently. In case of several preliminary sketches being desired for the same site and programme, the full fee is estimated for the first, and compensation for the others is based on the additional work they require. In case there are no preliminary sketches, but the architect is called in at the stage of working drawings, (a strange case), the fees for working drawings and specifications are increased one-fourth. On behalf of the client, there are special provisions that all commissions or rebates will be turned over to him and that he may ask for expedition in the preparation of plans without incurring an extra charge. The client is to bear the cost of all contingent work, that is to say, of all surveys, measurements, examinations of foundations, etc. He is to pay the salaries of inspectors and superintendents, the expense of establishing and running a special office, the cost of advertising and closing contracts, and that of measurements for the final estimates. The cost of engineering advice to an architect, or of architectural advice to an engineer, is also borne by the client. Work by time is $5 for the first hour, and $1 for each hour additional. For journeys $6 a day is added to the usual fees; but this charge can be made only once, i.e., if two or more clients are served by one journey, the $6 charge is divided according to the facts of the service.

With such handsome allowances for services beyond ordinary necessities, one would expect to find the ordinary charge kept rather slim, but it is not so. The method of computing the fee is by percentages upon a sliding scale of cost and under four heads of elaboration in the character of the work; so that the fee increases as the proportion of finish in the work increases and decreases with the increase of total cost. The headings of degree in elaboration are not set forth in terms of the character of the work, but in terms of the percentage of finish. There are four such groups, and a fifth of furniture and fittings. The table will best be explained by reproducing it in extenso:

Architectural Fees, in Percentages of Cost of Construction.
Minimum Charge for Groups I–V

Total Cost in Dollars.	I	II	III	IV	Extra for no e finish.	Charge for Group V.
	Percentage Finish is to Total Cost.					
	20%	30%	40%	50%		
250	6.00	9.00	12.00	15.00	0.135	21.00
500	5.60	8.40	11.20	14.00	0.125	19.60
750	5.30	8.00	10.60	13.30	0.120	18.60
1,000	5.10	7.70	10.20	12.80	0.115	17.90
1,250	4.90	7.40	9.80	12.30	0.110	17.20
1,500	4.80	7.20	8.60	12.00	0.108	16.80
1,750	4.70	7.00	9.40	11.70	0.106	16.40
2,000	4.60	6.90	9.20	11.50	0.104	16.10
2,250	4.55	6.85	9.10	11.40	0.103	15.95
2,500	4.50	6.80	9.00	11.30	0.102	15.80
3,750	4.30	6.50	8.60	10.80	0.097	15.10
5,000	4.10	6.00	8.20	10.30	0.093	14.50
6,250	4.00	6.00	8.00	10.00	0.090	14.00
7,500	3.90	5.85	7.80	9.70	0.088	13.60
8,750	3.80	5.70	7.60	9.50	0.086	13.30
10,000	3.70	5.55	7.40	9.30	0.084	13.00
12,500	3.50	5.40	7.20	8.00	0.081	12.60
15,000	3.60	5.25	7.00	8.70	0.079	12.20
17,500	3.40	5.10	6.80	8.50	0.077	11.90
20,000	3.35	5.05	6.70	8.40	0.076	11.75
22,500	3.30	5.00	6.60	8.30	0.075	11.60
25,000	3.25	4.95	6.50	8.20	0.074	11.45
37,500	3.10	4.70	6.20	7.80	0.070	10.90
50,000	3.00	4.50	6.00	7.50	0.067	10.50
62,500	2.90	4.30	5.80	7.20	0.065	10.10
75,000	2.80	4.20	5.60	7.00	0.063	9.80
87,500	2.75	4.10	5.50	6.90	0.062	9.65
100,000	2.70	4.00	5.40	6.80	0.061	9.50
125,000	2.65	3.90	5.30	6.60	0.059	9.25
150,000	2.60	3.80	5.20	6.40	0.058	9.00
175,000	2.55	3.75	5.10	6.30	0.057	8.85
200,000	2.50	3.70	5.00	6.20	0.056	8.70
225,000	2.45	3.65	4.90	6.10	0.055	8.55
250,000	2.40	3.60	4.80	6.00	0.054	8.40
312,500	2.30	3.45	4.60	5.80	0.052	8.10
375,000	2.20	3.30	4.45	5.60	0.050	7.80
500,000	2.10	3.20	4.30	5.40	0.049	7.50
625,000	2.05	3.10	4.15	5.20	0.047	7.25
750,000	2.00	3.00	4.00	5.00	0.045	7.00
1,000,000	1.95	2.95	3.90	4.90	0.044	6.85
1,250,000	1.90	2.90	3.80	4.80	0.043	6.70
1,500,000	1.85	2.85	3.70	4.70	0.042	6.55
1,750,000	1.80	2.80	3.65	4.60	0.041	6.40
2,500,000	1.75	2.70	3.55	4.50	0.040	6.30

Note: In using this table, the total c st will be rounded off to the next hi her tabulated amount provided the fees are increased by so doing.

INJURIOUS EFFECTS OF GAS ON ASPHALT.

The fact has been established that the gas escaping from underground mains injuriously affects asphalt pavements on streets where such leakage of gas occurs. The first noticeable effect is checking of the surface of the asphalt. This is followed by general disintegration. Instances are recorded in which asphalt paving contractors have declined to fulfill their agreements to keep roadways so affected in repair, on the ground that their destruction was not due to defects in workmanship or to ordinary wear and tear of traffic.

MASTER PLUMBERS' CONVENTION.

The annual convention of the National Master Plumbers' Association of Canada will be held in the Temple Building, Toronto, on the 26th, 27th and 28th inst. The Executive will meet at 9.30 a.m. and the convention at 2 p. m. on the 26th. A large attendance is looked for, including representatives from the various Provincial Associations. Reports of the work done during the year will be presented and discussed. The local plumbers and plumbing supply firms have appointed a joint committee to arrange for the entertainment of the visitors. On the 27th inst. they will be given a carriage drive around the city, and in the evening will be held the annual Association banquet. After the election of officers and completion of the business on the 28th inst., it is proposed to make an excursion by electric cars to some place of interest outside the city, and there enjoy a musical program and luncheon. Strong inducements are being offered the Association to hold the annual convention next year in Halifax, Nova Scotia.

DECORATION METHODS AND MATERIALS.

By W. H. Elliott.

In attempting a short description of the methods and materials employed in interior house decoration at the present time, I shall endeavor to be as concise in my statements as possible—describing the material, its advantages and disadvantages, where it may or may not be used satisfactorily: and so of the methods employed.

As in other things decoration has its fashions—styles come and go in public favor, and in five years the decorations of a house may be quite out of date. This would be unfortunate if it were necessary. Many styles are never out of date and they are usually the most desirable, temporary styles having their destruction inherent in themselves. It is quite possible to carry out a scheme of decoration which if entirely appropriate to its position will always give lively satisfaction both in color and design.

I might also refer to some notions at times prevalent about the use of color which do duty for the time as decorations. Not long since I heard a lecture in which the theory that each color symbolized an abstract idea was gravely set forth—as that red was love—yellow, aspiration, etc. The folly of attempting to embody such ideas in schemes of decoration would be apparent to any one giving only slight attention to the subject. Of equal value was a scheme for the decoration of a church in which the color of the lower wall represented the bark of trees, higher up the leaves, then a golden sunset, and above all the pale green and blue of the evening sky. Very fanciful no doubt and possibly resulting in good hands in a harmonious arrangement of colour, but on what ground are we to transfer bodily the outer landscape to the walls of a church?

The possible scheme of colour is not objected to, but the gravity with which these and similar fads are presented as principles of decoration. The principles of decoration are worked on other lines. The amount of light usually governs the strength or depth of colour; the presence or absence of sunlight has its due weight, the purposes of the room, the tastes of its customary occupants and a hundred other considerations which are, not fanciful, but very practical, influence the decorator in his work.

To follow some of these theories would be to tie ourselves to a certain arrangement for certain conditions in every case. For example a very cheerful room may be carried out with blue as its motive color (no matter what its signification may be) and a very dismal room may result from a badly balanced scheme in yellow. And here let me say that in most cases one color should strongly predominate when a successful effect is desired. Too positive colors in nearly equal proportions are fatal to repose of any room. The exception to this is of course when the color is thoroughly broken up as in the Moorish or Romanesque styles. Another rule which is very safe is that all three primary colors should be represented in every scheme of decoration, otherwise a tame effect is certain. The red or yellow may be very much subdued in a blue room, and so of the other combinations, but their presence if ever so quietly introduced, is unconsciously felt as a satisfying impression.

Looked at from the standpoint of durability many of the materials employed are far from satisfactory, but happily or unhappily, durability is not often considered in present day decoration. The universal surface material, plaster, is anything but durable. Various attempts have been made to produce substitutes, but thus far without conspicuous success. For small surfaces what has been named plaster board is something of an improvement. It is usually a thickness of plaster-of-paris or ashestos in which coarse canvass or scrim has been incorporated. When this material is cast in ornamental forms such as cornices, friezes, centres, &c., it is called staff. Lightness and strength are obtained by this method and some comparatively large sections have been cast in this way.

For finer ornament various compositions are used which admit of plastic moulding to a limited extent. Ornament of this nature has become necessary on account of the extensive use of the French styles of the Empire, Rococco, etc. As a practical substitute for plaster the sheet metal designs so largely placed on the market at present are very satisfactory where the decorative effect is of little importance. They can hardly be classed as decorative material.

Where any work of importance is contemplated it is advisable to first cover the plaster surface with a strong cotton or burlap, so that cracks may not eventually injure the appearance of the work. Burlaps of various degress of coarseness are now used extensively for covering wall surfaces and are invaluable for the purpose—the texture giving an excellent surface for color or decoration. The color is obtained either by painting the burlap after it is fixed or by using the ready dyed materials which may be obtained in all desirable colors. Burlaps, cottons and other similar materials are applied to the wall with ordinary flour paste, the wall being pasted instead of the material. Joints should be overlapped about an inch to allow for shrinkage, left several hours, then cut through both thicknesses with a sharp knife, the strips removed and the two edges brought neatly together. Dyed material does not require overlapping as it is already shrunk. For painting, a rather open weave is preferable, the color not filling it so as to hide the texture.

Decoration in glaze colors, outline relief work, and other methods are employed with excellent effect on the painted burlap. Silks and woven tapestries are also used to a limited extent for covering the walls of the more important rooms of the house. The cost of these both in material and application is of course much greater than that of other coverings, and it is questionable if the results gained justify the additional cost. These materials are usually tacked to thin strips of wood which have been nailed on all angles of the wall, the joints being concealed by silk cord gimp or rounded strips of wood which have been covered with the wall material. A lining of ordinary cotton or Canton flannel is usually applied first to the wall to protect the more expensive material from dampness and to give a softer surface. Hand-woven tapestries are only possible to the very few, so that practically we are confined to the products of the machine loom. All of these are closely reproduced in the many beautiful wallpapers now to be had. I have always maintained that such imitation is perfectly justifiable, as the material or groundwork is only a medium for transferring the design to the wall and of no importance in itself beyond its suitability for the special work in which it is employed. Ordinary silk will not retain its appearance on the wall as long as its reproduction in wallpaper, its

texture making it a receptacle for dust, smoke, etc., which in a short time completely ruins its surface. No doubt this is more especially true of our houses in Canada, shut up closely as they are during a long winter with the accompanying accumulation of dust.

This brings us to the consideration of wall paper as a medium for decoration—a material more generally used than any other and undoubtedly more broadly adapted to the various requirements of house decoration. As I have already said, wall paper has been designed to reproduce other materials in a cheaper and more practical form. Silk, leather, tapestry, cretonnes, etc., are now to be had in wall paper in their choicest designs. The first cost of die cutting, etc., being distributed over a large output the richest and most elaborate examples of each fabric may be copied. How one is deceived by these reproductions when on the wall, but one may have the very best of design and weave the world affords, while if attempting to use the actuat fabrics only a very moderate and perhaps undesirable selection is possible. There is of course a very large range and very superior range of designs which are not copies of anything but simply wall paper.

Wall papers are broadly divided into hand-made and machine-made—pressed flat, gilt and color. The manufacture of hand made papers follows somewhat the earliest type of printing press, but while the old printing press has long been discarded, the hand or block printing machine still retains a large place in wall paper manufacture. The advaotages are a more solid layer of color and as a consequence a more forcible effect on the wall. Large designs also may be printed with blocks when the expense would be too great to construct a machine for the purpose. But of late years, with perfected machinery and skilful printing many designs are produced which test the ability of an expert to detect as not hand. made. The best designs come from England—that is designs which are purely wall paper, not imitations of any other fabric. Such men as Burne Jones, William Morris, Lewis F. Day, Walter Crane and others have given their best efforts to the designing of wall paper and the result is what might be called a school of wall paper design which is drawn upon by the designers of other countries. These men by no means treat the wall as in all cases merely a background for other things, but rather as an important feature in the furnishing of the room. Of course where important pictures are to be hung many of their designs would be quite inappropriate, but unfortunately the number of important pictures bears a ridiculously small portion to the number of rooms to be decorated. French designs excel in reproduction of silks, leathers, etc. and many of their papers are exquisite examples of the art of wall paper making. By far the largest proportion of designs are studies of natural flowers slightly conventionalised. Always popular and easier of treatment than ornament. they peculiarly appear in the season's lines although the really good floral designs of one season could be counted on the fingers of one hand.

Within the last year or two the reign of the frieze has perceptibly drawn to its close. At one time considered a sine qua non in every room—in fact almost as essential as the furniture—it is now relegated to the cheap parlor combinations as they are called, where ceiling frieze and wall are beautifully matched, saving brains and much anxious thought to the dealer and the buyer. Wall papers are now usually carried to the ceiling or cornice and finished at the top with a picture moulding. Ceilings if good are painted or tinted, if cracked are papered with something simple in design and of almost one color. Sometimes the ceiling color or paper is brought down a short distance on the wall to meet the wall paper at the picture moulding. Sometimes the upper third of the wall is covered with a different design from the lower two thirds, the picture moulding again acting as divider. A very pretty treatment for bedrooms is to carry a narrow border around each wall of the room forming them into large panels. These borders frequently have corner pieces to match. Papers with the texture of burlaps, denims, &c., make a very good lower wall and are an excellent background for pictures. Ingrains or cartridge paper are now very little used. Pressed or raised papers except in leather effects are not much in use, good coloring being preferred to their somewhat showy effect. The stripe designs which come to us at present in such abundance will not continue to occupy so large a place in dealers' collections, yet they have an important use in giving an appearance of height to rooms whose ceilings are undesirably low, besides being an agreeable change from the ordinary run of designs. The old cretonnes and chintzes furnish a range of beautiful patterns for bedrooms, morning rooms, etc.

The proper treatment for all of these patterns is to simply cover the wall with them as would be done with the actual material.

Coming to the woodwork of the room we find a variety of new tones for natural wood. Rich browns, deep mossy greens, Flemish oak finish, may be applied to ordinary pine or white wood with highly satisfactory results. The strong reds and greens of the wall at once call for special treatment of the woodwork and these deep tones are the result. In direct contrast are the white and ivory tones which set off equally well the reds, greens and blues of the wall. The old fashioned drawing room in white and crimson or green is very much in evidence at present, while in the bedchambers white woodwork prevails, almost to the exclusion of everything else. Graining, while not tabooed on aesthetic grounds as formerly does not seem to find a place with other prevailing features. Oak among hardwoods is in great favor but more frequently finished in Flemish, Log] oak coloring, than in the natural wood.

One of the most desirable importations of old world ideas is the more general use of hardwood floors. Very few realize the danger to health which lurks in the harmless looking carpet which in many cases remains securely tacked to the floor for several years. An analysis of the dust accumulated in that time has revealed possibilities of disease which in many cases must have neutralized in the actual thing.

A permanent floor may be laid in any house on top of the existing floor without alteration to doors or other woodwork of the room and at the cost of ordinary carpet. Parquetry designs add decorative character to this part of the room. Not the least important advantage gained by the use of hardwood floors is the introduction of the very artistic and everlasting Eastern hand made rugs which now adorn so many of our homes. When the life of these things is considered, the money expended upon them is probably the best investment possible in house furnishing.

THE CHARACTER OF SAND GRAINS.

It has been pointed out by Sorby and others, that by the aid of the microscope much may be learned concerning the history and character of sand grains. He has classified them into five groups, which, however, graduate into each other. These are:—

1. Normal, angular, fresh-formed sand, such as has been derived almost directly from the breaking up of granitic or schistose rocks.

2. Well-worn sand in rounded grains, the original angles being completely lost, and the surfaces looking like fine ground glass.

3. Sand mechanically broken into sharp angular chips, showing a glassy fracture.

4. Sand having the grains chemically corroded, so as to produce a peculiar texture of the surface, differing from that of worn grains or crystals.

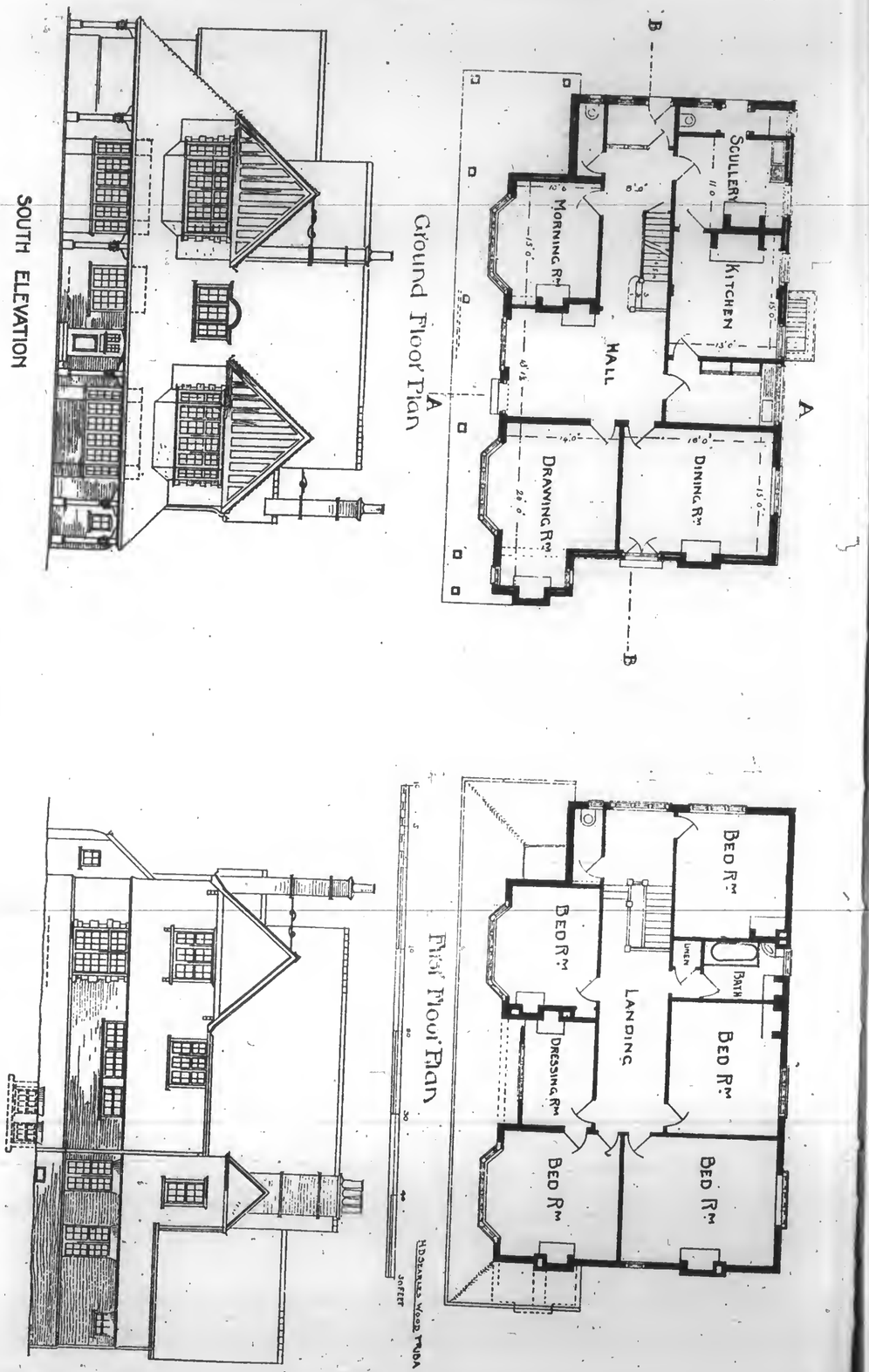
5. Sand in which the grains have a perfectly crystalline outline, in some cases undoubtedly due to the deposition of quartz upon rounded or angular nuclei of ordinary non-crystalline sand.

In the manufacture of bricks fired at a low temperature, No. 3 above described is no doubt the best, as it possesses certain binding qualities; but the usual type of sand met with in ordinary brickyards is either No. 1 or No. 2.

NOTES.

The value of building permits issued to date by the Inspector of Buildings of Winnipeg is $630,575, as compared with $383,633 for the same period last year.

The annual convention of the American Society of Civil Engineers opened at Niagara Falls, on the 25th inst., and will close on the 28th inst.



SMALL SUBURBAN HOUSES.
(Illustrations accompanying paper by Mr. Searles-Wood before the London Architectural Association.)

MONTREAL CORRESPONDENCE.

INSURANCE RATES.

The result of the refusal of the property owners to sanction the expenditure for improved fire equipment seems likely to be a further increase in insurance rates. At a recent meeting the Canadian Fire Underwriters' Association adopted the following resolution :—"Resolved, that the association records, with regret, the non-acceptance by the property owners of the recent proposed by-law for the improvement of the fire brigade and appliances and the consequent inability of the city to remedy, even in a modified form, any of the defects detailed in Inspector Howe's recent report on the city's fire brigade and appliances. The attention of the company is drawn to the matter with a view to considering whether the rates now obtained are adequate to the hazard." The Association appointed a committee to consider what action should be taken.

QUEBEC CONCILIATION AND ARBITRATION ACT.

An Act respecting Councils of Conciliation and arbitration for settling Industrial Disputes, passed the Quebec Legislature on March 28th. Its provisions are quite similar to those of the Ontario law of 1897. It provides for a Council of Conciliation consisting of representatives of the parties to the dispute ; and a Council of Arbitration a body of a more permanent character, which may, upon application of one of the parties, hear cases which have been before a Council of Conciliation without being settled, or, upon application of both parties, hear cases which have not first gone to the Council of Conciliation. The award of the Council of Arbitration is not binding, excepting with the assent of the parties. The failure of the parties to accept the award does not, however, prevent a further reference to a Council of Conciliation.—The Act applies to all employers employing not less than ten men in the same business.

P. Q. A. A.

At the special meeting of the P.Q.A.A. held on the evening of the 8th ult. there was quite a large attendance, among those present being noticed Mr. Tanguay from Quebec, Messrs. Venne, Archibald, Brown, M. Perrault, A. T. Taylor, Doran, E. Maxwell, W. S. Maxwell, Raza. Resther, Saxe., Lacroix, Monette and others. There was considerable discussion on the new tariff of charges and several strong objections were made by some of the members, but the following resolution was finally adopted : "That a vote of thanks be tendered to Mr. Maurice Perrault for the trouble he took to obtain the tariff for the P.Q.A.A. but we trust it will be amended as soon as possible."

The clause which met with opposition was

On all classes of buildings, costing from $50,0000 to $150,000 four per cent.

On all classes of buildings, costing more than $150,000 three per cent

The tariff formerly did not vary on account of the amount spent—only on the class of buildings. We presume the law is intended to read "for the first $50,000 at 5 per cent. for the next $100,000. at 4 per cent. and above that figure at 3 per cent." otherwise there will be the absurdity and injustice of an architect's commission on a building costing say $48,000 bringing a higher remuneration than one costing say $51,000.

NOTES.

As Mr. Owens is now one of the city's assessors, he has been obliged to give up his business as painter and decorater, and has therefore sold out the good will to his foreman, Mr. Houte.

A fire recently broke out in the offices of the Mount Royal Cemetery Company. A new building is already being built larger and more convenient from plans by Messrs Hutchison & Wood.

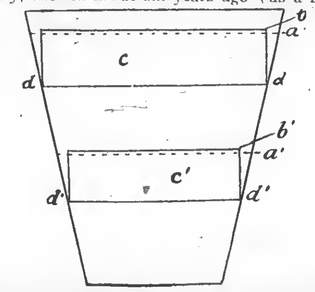
The building materials of the old St. Anne's and St. Gabriel Markets were sold on the 13th ult., so that these old city relics are a thing of the past. They have for many years been carried on only at a loss to the city so that we imagine there will not be many tears shed at their departure.

As Royalty is intending to pay Montreal a visit shortly it is trusted that some attempt will be made to put the streets in better repair abd also that owners of property will do their share in, putting a new coat of paint on the front of buildings in good order. It is wonderful what a well kept grass plot in front of a house adds to the general appearance so that it is well for architects to bear it in mind.

BRICK IMMERSION TESTS.

One of the greatest difficulties that experimenters on the different physical properties of bricks have had to contend with says a writer in the British Clayworker, is that connected with absorption. The older experimenters used to place the brick under an air pump, and having (as they thought) exhausted all the air from it, they proceeded to immerse it in distilled water. All of which is a careful and cautious proceeding, no doubt, but which had subsequently to give way to the exigencies of practice. Then engineers came along, with rough-and-ready ways and no time to spare, and they simply shot the brick into a tub of water, weighing it before it went in and after it came out—the difference, they held, indicating the porosity of the brick. On second thoughts, both they and the few architects who then took an interest in the subject, began to form the belief that the element, time, ought to be taken into account ; but they came to the erroneous conclusion that the longer a brick stayed in the water the more water it absorbed. At about the same period, the chemist announced that bricks contained, as a rule, a considerable amount of matter which was soluble in water, so that the absorption tests ought to be considered pari passu with loss of solvent material, when weight only was to be employed as a criterion of absorption. In other words, there was waste, they said, as well as absorption.

The present writer, who in his time has tested the absorptive capacities of different kinds of bricks throughout the country, shewed about six years ago (as a result on



over 400 different bricks) that none of the methods then in vogue gave accurate results. At a very early stage in his work he discovered that when a brick was placed under water it was increasingly difficult for the air to escape from the pores of the brick as the depth of water above the brick was increased. The same brick placed in water three feet in depth gave a different result to the same when only immersed six inches. So, therefore, he devised a plan, which has proved highly satisfactory, that of leaving one of the long narrow edges of the brick just above the surface of the water—the remainder of the brick being immersed. The intrusion of the water into the brick on its immersed sides tends to expel the air from the free surface above the water, and thus there appeared a possibility of arriving at a standard method of testing. And the writer is of opinion that this is the most accurate method of testing absorption.

His further tests, however, have shewn him that there was something lacking, in that the bottom of the brick always rested on a flat surface, and thus precluded the water from having free access to that portion of it.

As a consequence, he has devised a method which, so far as he is aware, is new, though it seems so simple that it is possible another experimenter may have thought of the same thing. This method is illustrated in the accompanying diagram. The vessel containing the water is bucket-shaped—wide at the top and narrow at the bottom. It is designed to take both large and small bricks. Let a represent the water level, c the brick, and b the surface of the brick just projecting above the water. It will be obvious that the only parts of the brick which touch the sides of the containing vessel will be situated at a, so that the water has free play, to enter the bottom and sides of the partially immersed brick.

When a smaller brick is being dealt with it is necessary to lower the water level, so that the relative positions are a, b, c, d, as shewn in the diagram.

It is necessary in these experiments to put in more water to compensate for evaporation during long-time tests and any waste (as from a rubber) should be carefully noted. Where necessary a chemical examination of the water at the end of a test may be made, to discover if the brick has suffered from dissolution by chemical means. In practice, however, the latter will not often be found necessary, as the difference in actual absorption by the improvements brought about by this new method is sufficiently well marked to tell its own tale.

ACCIDENTS TO RESERVOIR DAMS.

By C. Baillargé, Mem. Am. Soc. C. E.

The late washout at the reservoir dam at Middlefield, Mass., and that at Chicoutimi, Que., can only avail as lessons in "The Instructiveness of failure" when the way in which they occurred can be made known to the profession.

True, it has been shown that in the Middlefield case, where the dam was but 20 feet high, and the level of the spill-way 15 feet, the gates over the spill-way could not be opened due to their faulty construction and that the water rose till it poured over the dam and caused its destruction; but how the erosion could have caused the wreck is not explained, in view of the fact that between the outer walls of the dam which was 30 feet in breadth and abundantly heavy and strong to resist any pushing or forcing of the dam forward as at Boazey in France, Austin in the United States and ealsewhere, there were two intermediate bulk heads or walls of 2-inch matched sheet piling on boarding.

No gradual erosion from the top downwards could therefore have occurred on account of these intervening water tight partitions. The only way then of explaining the washout through and through the dam, is this: the overflowing water, first wore away the outer, lower or down stream of the three vertical sections of earth work into which the dam was divided by the bulk heads, taking with it the rubble work of the revetment wall, the component stones from which were found as far as 500 feet down the river.

When this outer or lower portion of the dam had crumbled away, the lower of the two bulk heads followed suit, after which the over-pour of water immediately attacked and scoured away the middle section of the earth work, followed by the overthrow of the upper or inner bulk head, and this by the immediate cutting through and down, by erosion, of the inner or up-stream suction of the earth filling with its protective wall of dry rubble.

Where a portion of the clay filling was resistent enough to hold its own against the scour, up to a certain height from bottom level of reservoir, the portions of the bulk heads above that level, were of course broken off at level of top of remaining clay by the direct pressure of the water behind them.

The Middlefield mishap is therefore a case not of the bursting of a dam, not of a bodily pushing away of the dam as at Austin, but one where the dam failed, as do the levees along the Mississippi, by erosion of the water from above downwards.

We shall now see that the accident at Chicoutimi is a case of erosion from below upwards. The dam across the Chicoutimi, which is one of the out-flows or discharges from Lake Kinogami and its smaller companion as expressed by the diminutive "Schish" Kenoganischish, is about a mile from the city or town of Chicoutimi, the Metropolis of the Saguenay District.

The dam is built at right angles across the stream, a powerful one empting into the Saguenay river. It is a wooden structure of crib work with a base up stream of about 3 to 1, planked over with a water tight flooring and relying for its stability on being kept down and in situ by the very weight of water above it, some 20 feet higher than on the down side, and though, the higher the water within the reservoir the greater the thrust outward or downward, the greater also the weight upon the dam and its adherence to the bottom on which it rests and is probably bolted to.

Above the dam proper is a superstructure some 10 feet or more in height answering as a bridge or roadway between the opposite sides of the river and to the upper or up stream side of this superstructure are adapted a series of some 20 gates or more, but which, as at Middlefield, must have been inoperative due to their great size under a head of some 10 feet of water against them: for the water on the occasion of the accident about to be related rose to 19 feet above its normal freshet level and evidenely pressed hard against the dam superstructure which is entirely too narrow, it being but 12 feet wide instead of 20 which it should have been; and to proof, it is now bulged down stream, wriggled and out of plumb as well as out of line.

Now while this dam of some hundreds of feet in extent across the river was solidly abutted against the river's high and rocky bank at one or its eastward end; the western end of it rested on or a few feet into the face of a bank of quite a different nature on the opposite side; where not only does the rock rise to or crop out at level of bed of river; but the material above it and for a height of some 50 to 60 feet is nothing but the most irresisting soft clayey sand and vegetable mold.

Had the precaution, an expensive one of course, been resorted to, as was done at Grand Mére on the St. Maurice, in an absolutely similar case, of rip-rapping the face of the cliff from the dam to some distance up stream or of a wooden revetment against wash and scour of river, the accident likely might not have happened. It would certainly not have occurred had this cliff revetment been made water tight to a certain height, even though it should have cost an extra $20,000 or more to do so along a stretch of 200 to 300 feet.

What happened is this: the water having on the occasion risen to 30 feet, a pressure of 13 pounds to the square inch or close upon 2,000 lbs. to the foot, a great tendency to filtration through the bottom of the bank (where the strain was irresistible by material of the light and loose structure alluded to) was brought about, and a leakage through and around the western end of the dam was seen to occur. Under such pressure and through such friable material it may easily be imagined how quickly the scour did its work, increasing in a few hours the water way through the bottom of the bank to the dimensions of a sewer and then enlarging sidewards and from below upwards, to the vastness of a tunnel, when of course the roof or over-lying earth caved in—the out rushing water in the mean time wearing away the side hill from below and causing the cliff to go piece by piece almost vertically in slices from 4 to 6 feet thick at a time, till the gap up stream from the dam reached to a distance of some 200 feet, while in the direction of the length or axis of the dam prolonged, the hill was cut into by not less than 300 feet and the scour down stream or below the dam wore away the bank of the river to a distance of more than 700 feet.

The quantity of material carried away—the cliff as already stated being some 60 feet high—is not less than 300,000 cubic yards discoloring the water of the Saguenay for miles below the town and rendering it for the time being unfit to drink.

The dam will of course now have to be extended by some 300 feet or more to the opposite bank or to the present site thereof, while a temporary dam will have to be built to confine the water to passing over the present dam till the extension is put in; but the whole structure should be widened out down stream by say 20 feet, to support a bridge and gate superstructure of some 25 to 30 feet in breadth and capable of holding its own against any subsequent rise of like magnitude in the river; and this should be done at any cost and in the the company's own interests; for as the area of the reservoir or breadth of water upheld will hereafter be of so much greater an extent westward, a second accident of the kind might sweep down upon the city and destroy thousands of dollars worth of property, with probably or at any rate possible loss of life for which the company might be held responsible—and a stitch in time saves nine.

I would also say here in relation to the new concrete dam at the Chaudiere—it was quite a question this spring whether it would not give under the immense ice pressure against its almost vertical inner or upper face, and my surmises of last fall when writing on the subject have now become a certainty, and to the effect that inward of this concrete rampart should be made an inclined apron of crib-work of two or three feet of base to one of height boarded over with deals or plank laid parallel to the flow of water, and such that any future tendency of an ice jam against the dam will be done away with by the certainty that the swell of the ice forward or down stream will shove it up the incline and topple it over the dam in a way to do no damage to the permanent structure.

THE CLASSIFICATION OF ROMANESQUE ARCHITECTURE.*

By Francis Bond, M. A.

The subject of the classification of the Romanesque styles was a large one, and could only be dealt with shortly within the limits of his paper. Classifications already existed—those of De Caumont, Quicherat, Viollet-le-Duc, and particularly Anthyme Saint Paul, were referred—but they helped one but little forward. It remained to consider whether a wider basis of classification could not be found—one resting on the main facts of plan and structure.

First of all, what was the one thing that the old builders—whatever the schools they belonged to—were trying to do? With the exception of a certain number of them who were attempting to solve the church-building problem by following the type of St. Stefano Rotondo at Rome or of St. Vitale at Ravenna, and whose further outposts, with the exception of the churches of the Knights Templars and the Knights Hospitallers, are to be found in the churches of Aix-la-Chapelle, Ottmarsheim, and Germigny-des-Prés, all the builders of Western Europe, from the ninth century, when Romanesque architecture commenced, to the twelfth century, when it was superseded by Gothic, were engrossed with one supreme problem—how to vault a basilica. This was the master problem of the builders of the Middle Ages from the end of the ninth to the middle of the twelfth century. The amount of engineering skill, the ingenuity, and the variety of the solutions proposed were astonishing. They seemed never to have had their full due. Gothic architecture got nearly all the credit. As a matter of fact, every single one of the main difficulties inherent in the task had been effectually met—and met in more than one way—before the first Gothic architect ever handled a trowel. Early in the twelfth century, or before, at least five complete solutions had been arrived at, as may be seen at Le Puy, Tournus, Cluny, Speyer, and Durham.

The problem how to vault a basilica meant—(1) that there were to be aisles as well as a high nave; (2) that some form of vault construction was to be devised; (3) that since a vault of stone was heavy, piers must be substituted for graceful, but weak, classical columns; that the thrusts of the high vault of the nave must be stopped in some way by abutment in or above the aisles; (5) that top-lighting by clearstory windows was to be retained; (6) that the outer surface of the vault must be protected from the weather.

(i.) In most cases one or more of these conditions were evaded. One school—the most ancient of all which held the whole of the field till the ninth century—simplified the problem by omitting the vault and retaining the colonnade.

(ii.) A second solution—also very incomplete—was to omit the aisles; to build a hall-church roofed with a tunnel vault. This simplified the question of supports, for it substituted solid walls for hollow arches; any amount of clearstory light could be introduced, and the walls could be thickened to any extent to provide continuous abutment to the thrust of the great tunnel vault. Everywhere it was the natural and proper solution where only a small church was required, but it was employed in Provence even in churches of cathedral rank.

(iii.) A third method, represented by the school of Périgueux, also removes the difficulties of supports, abutment and top-lighting by eliminating the aisles. It presents us with another variety of hall-church, roofed, not with a tunnel, but a row of domes, and it is to be noted that the corners of each square bay of the nave are filled in with pendentives to support the dome.

(iv.) The next method is found only in the church of Loches, near Tours. Originally there was a low tunnel-vaulted nave, with aisles, of the 11th century. But about 1160 the eastern portions of the nave were pulled down, two square bays were formed, and on these bays two spires were erected.

(v.) In two churches of the first rank a row of domes was employed to roof an aisled nave. The nave was spanned by a series of strong arches. These were so placed as to divide the nave into square compartments. On each square an octagonal dome was poised, the corners of the square being filled up with corbelling or squinches to afford support all round to the base of the dome. The typical example of this is the wonderful cathedral of Le Puy, the nave of which is roofed by a row of six domes on squinches.

(vi.) The next method may be distinguished as the arch-and-lintel system. Strong transverse arches were built across the nave about 9ft. apart; a wall was built on each arch rising up to the apex of the arch, and then lintels of basalt were laid longitudinally—i.e., from west to east. Count Vogüé has fully illustrated this curious phase of architectural history in "La Syrie Centrale."

(vii.) We next come to a whole series of attempts to solve the problem by covering an aisled nave with what is called a tunnel, waggon, barrel or cradle-vault. Of these the most scientific is that of Tournus Abbey church. As in the churches of Syria, the nave was spanned by stout arches, each arch carrying a wall. But each pair of these walls, instead of carrying lintels, as in Syria, carries a short tunnel set transversely.

(viii.) We now come to the vast number of churches in which the tunnel-vault of the nave was placed longitudinally—i.e., in the direction of the axis of the church. The naves vaulted with longitudinal tunnels may be divided into those (a) where the tunnel rests on a pier-arcade; (b) where the tunnel rests on the arches of an upper vaulted aisle; (c) where the tunnel rests on a wall pierced with clearstory windows.

(ix.) Such interiors as that of Notre-Dame de Poitiers were painfully low. It would have been dangerous, however, to raise the tunnel much by increasing the height of the piers. So in Auvergne especially, the expedient was hit upon of building two aisles instead of one, both vaulted; then the tunnel could spring at a much higher level. Moreover, some of the gloom of the Poitevin type of nave could be dispelled by piercing the back wall of the new upper aisle with windows.

(x.) The first step to carry out the one unfulfilled condition in the problem—the provision of clearstory light—was taken by piercing the base of the tunnel itself with clearstory windows. The final step—a most important change—was to insert the windows wholly in a clearstory wall. This latter seems to have been accomplished independently in the south, in Provence and Languedoc; in the north, in Burgundy. The clearstory was already in use in tunnel-vaulted churches in the eleventh century at Saint Guil, Helm-du-Désert in the Southern Cevennes, and in Burgundy on a small scale at Saint-Benôit-sur-Loire (commenced 1089.)

(xi.) This solution, which was destined, with a generation or two, to culminate in the Gothic architecture of Saint-Denis (1140), consists in covering a nave with unribbed groined vaults.

(xii.) The final step was to substitute the ribbed for the groined vault, to dispose the vaulting compartments of the nave in oblongs, to facilitate the vaulting of these oblongs by the application of the pointed arch, and to transmit the thrusts of the high vault by means of flying buttressess to the buttressess of the aisle walls. To this, Gothic architecture added three developments: (1) It weighted the buttresses with pinnacles; (2) to a large extent it replaced the masonry of the walls by glass; (3) in Durham nave, the Abbaye-aux-Dames, and elsewhere, abutment was isometimes provided by flying buttresses disposed beneath the aisle roof. In Gothic the flying buttresses are placed above the aisle roof.

(xiii.) This method, which consisted in omitting the vault, was no solution at all. The nave is not constructed in genuine basilical fashion, as in the first method, but is built as if a vault were intended. The home of this unworthy construction is Normandy.

Of the foregoing solutions of the vaulting problem, the third, the employment of a dome resting on pendentives, is by itself a full and satisfactory criterion. It occurs nowhere except in a group of some thirty-five churches in the district of Périgueux, with such "outliers" as Fontevrault and Angoulême. No. 2, the hall-church, is most

*Abstract of paper read before the Royal Institute of British Architects.

common in the south-west and south of France, from Poitou to Provence. It may be vaulted either with a longitudinal tunnel or with groined or ribbed vaults. No. 8, where a tunnel vault rests directly on the pier arches, occupies much the same districts as No. 2. No. 9, where the tunnel rests on the arches of an upper aisle, extends from Clermont-Ferrand, in Auvergne, to the south-west as far as Conques and Toulouse. No. 10A, where the tunnel is combined with a triforium and clearstory, is the final development reached in Burgundy. No. 10B, where there is tunnel and clearstory, but no triforium, is the solution of Provence and of Piedmont. No. 12, the ribbed vault, occurs sporadically, except in Germany and Lombardy, where it is characteristic. No. 13, the unvaulted nave, was nearly universal in Normandy and England till the twelfth century was well advanced.

The author went on to consider how these eight divisions will stand other tests. A very important test is afforded by the planning of a church, especially of its eastern limb. It must suffice to trace four main types of choir-plan. The first is that with three parallel eastern apses, of which there is a variant with square-ended aisles, as at Cerisy-la-Foret, and another with aisles square externally and semicircular internally, as at Romsey. This is pre-eminently the plan where the unvaulted nave prevails, viz., Normandy. It is frequent in Lombardy and in those Provencal churches that have aisles. A second plan is that of the ambulatory and "cheviot." It is rare in Germany, Lombardy and Provence and non-existent in Normandy (excluding England.)

The plans alone, apart from other considerations, would entitle Germany to rank as a distinct architectural province. In Provence the aisled churches generally have three parallel eastern apses.

The divisions may be tested again by the treatment of the central tower: (1) its vaulting; (2) its shape whether square or octagonal.

The Romanesque builders had three forms of vault at their disposal in the eleventh century; the groined vault, the tunnel vault, and the dome. The most difficult problem they had to cope with in vaulting was the question of putting a vault over the crossing, resting not on walls, but on four unbuttressed legs. They had hardly dared yet to put a groined vault over their naves, fearing its concentrated thrusts. Their favorite tunnel vault could not be used at all at the crossing, for it needed solid walls for its support. They had perforce to use the dome, in all cases, except in the Périgueux district, resting on squinches. Secondly, they had to stop the thrusts of this dome by carrying up a central tower to weight the arches or walling on which the dome rested. As regards the shape of this tower, they had two alternatives. The crossing was square, and so the tower over it might be square, as was the great central tower of Cluny and that of Tournus But the squinches reduced the square of the crossing to an octagon; and as the tower rested directly on the octagon and not on the square, it was more natural that the tower also should be octagonal. Hence that magnificent series of octagonal central towers in Burgundy, and Southern France, Germany, and Lombardy, culminating at Mayence and Saint-Sernin, Toulouse. In Normandy and England, on the other hand, the builders hardly ever dared to vault their naves at that early date, and never the crossing. And there being no dome in an Anglo-Norman tower, it is square.

Another test is afforded by the grouping of the towers. (1) The glorification of the tower reaches its highest pitch in Germany. Six towers are found at Speyer, Worms and Laach, seven at Limburg. (2) In Burgundy the magnificent tower group of Cluny seems to have remained without a rival. Its daughter churches were satisfied with at riplet; an octagonal central tower and two square western towers was the favorite arrangement. The towers had several stages, similar in form. (3) In Normandy also the triplet was the favorite, but the central tower was square, and not domed internally. (4) In Poitou the characteristic is the conical spire "en pomme de pin," which often surmounts the tower. (5) In the Périgordian region is seen the same conical spire, together with the characteristic cupolas. (6) In Provence "a simple square tower is commoni with a very low spire." But some have central octagons. (7) In Auvergne a specially characteristic arrangement is that of a square western tower in the centre of the facade and a central octagon. (8) In Northern Italy the campanile type greatly predominates, and where the massive Romanesque tower is found, it is usually divided (in campanile fashion) into very numerous stages. Nowhere, except in the Como churches, does the campanile form part of the structure of the church; often it is quite detached.

We may discriminate the following eight schools of Romanesque: I., the Périgordian; II., the Poitevin; III., the Provencal; IV., the Auvergne; V., the Burgundian; VI., the Norman; VII., the German; VIII., the Lombardic.

As regards the above classification, one word of caution is necessary. In speaking, e.g., of the style or school of Auvergne, it is not meant that all the churches in Auvergne were built in this style, or that there were no such churches outside Auvergne, but merely that such churches were more common in Auvergne than elsewhere, and may therefore for convenience be described as belonging to the style or school of Auvergne. Also that those features described as characteristic were not invariably found; they were merely those which occurred most frequently.

One is tempted to try to work out the relations to one another of the different schools. Certain resemblances are patent. The super-imposed aisles link the style of Lombardy to that of Auvergne; German Romanesque is connected with Lombardic on the one hand, and with Norman on the other. But a much more exhaustive classification is necessary before any results of lasting value are likely to be obtained.

Still stronger is the temptation to enquire into the origins of all the Romanesque styles, whether they are derivatives, as some have held, from Provence, or as others have held, from Lombardy. Such architectural pedigrees are not, as a rule, trustworthy. And there always remains an alternative hypothesis, which seems to have within it much of truth, namely, that the styles were none of them mainly derivative, but that the same problem was engaging all the different regions more or less simultaneously; that the builders of each region were solving it, with some little light, indeed from their neighbors, but mainly independently, by empirical experiments of their own, aided by the survival here and there of traditions of Roman construction, and by the study of local Roman monuments.

Another caution requisite is that the classification does not cover the whole ground. This is necessarily so. Between each region and the next there was always a debatable ground, where two or more styles would be in simultaneous use. Indeed, a "pure" region would be the exception; the greater part of the area of any one country would employ mixtures of style. England is an instance.

It had always been customary, the author believed, to regard the Romanesque of England and Normandy as one. The Romanesque of Normandy, however, seemed to be a "pure" style, and that of England a "mixed" style. While by far the most important factor is the influence of such pre-Conquest churches as Bernay, Jumiè, and the Abbaye-aux-Hommes, we must also attribute some degree of importance, at any rate in the planning, to the highly developed Romanesque of Auvergne and Burgundy.

THE ONTARIO ASSOCIATION OF ARCHITECTS.

The walls of the O.A.A. Rooms have recently been adorned with a number of excellent photographs of interesting Architectural works in foreign lands.

In exchange for a copy of its proceedings, the Association is now receiving regularly the publications of the British and American Architectural Societies—also French, Italian and other Foreign Architectural periodicals.

The weekly luncheons held in the Association rooms every Tuesday have been well attended, and very enjoyable and profitable. They have served to promote acquaintanceship among the members, and afforded opportunity for the discussion of many subjects of interest to the profession.

STUDENTS' DEPARTMENT.

PORTLAND CEMENTS.

Portland Cement has been defined by the Association of German Portland Cement Manufacturers as the product of the burning to the point of sintering, and subsequent grinding to a fine powder of certain materials in definite proportions, chiefly carbonate of lime and clay. These raw materials are ground and mixed in either the dry or wet process according to their character—if the dry process is used the mixed materials are moistened and molded into bricks. In the wet process the bricks are made from the wet material after it has been reduced to the proper consistency. These bricks are dried and then burned in suitable kilns to nearly a white heat. The resulting "clinker" is then ground to a fine powder, i.e., the cement.

In the rotary kilns the material is introduced into the kiln in the form of dust or a liquid "slurry" and issues from the kiln continuously as burned clinker. The expense of drying, charging and emptying the kiln is thus saved. By the rotary process furthermore the output is double that of the continuous vertical kiln.

In vertical kilns the raw material has to be molded into bricks dried and then charged into the kiln with alternate layers of coal or coke.

Portland Cement is distinguished chemically from natrral cements in that it has a far larger proportion of l me, it must be either free, or nearly so from Magnesia; the temperature at which it is burned being necessarily much higher there is little or no Silicate left undecomposed; it must contain only a small percentage of Iron-oxide to prevent fusion of the material at this temperature.

The following comparison of the chemical analysis of a good Portland Cement with two Natural Cements of the Lime and Magnesia class will no doubt be of interest:

	Portland	Natural	
		Lime	Magnesia
SILICA	21.6	21.7	16.9
ALUMINA	7.4	8.3	11.0
IRON OXIDE	2.3	4.1	4.6
LIME	62.8	56.6	34.6
MAGNESIA	1.5	2.8	14.8
SULPHURIC ACID	1.3	1.3	1.0
ALKALIES	1.5	.0	1.8
IGNITION	2.4	8.2	4.8
SILICATES UNDE	.0	8.0	12.4

The Carbonate of Lime necessary may be Chalk, Limestone or Marl. If chalk is used it is mixed in water with the clay to a creamy consistency usually called "Slurry."

Limestone, unless it contains nearly the necessary amount of clay, has to be ground very fine in order that it may mix perfectly with the clay, so that wherever possible, Limestone is used that contains sufficient clay in order to obtain a perfect mixture by grinding only.

Portland Cement is manufactured chiefly in Germany, the United States, England, France, Belgium and Canada and is by far the most valuable of all the elements It usually consists of about 62 per cent. of lime, 22 per cent. of silica and 7 per cent. of alumina, (2 per cent. above or below these figures is the limit) together with small percentages of magnesia, oxide of iron, etc. A very slight difference in the manufacture of the material or in the chemical composition of the material itself may take considerable change in the value of the resulting cement, so that it is very necessary to resort to rigid testing if the best cement is required. The American Society of Civil Engineers recommends that tests be confined to methods for determining Fineness, Liability to Check or Crack and Tensile Strength.

As to fineness of grinding it may be stated that the coarse particles act practically as sand, and it can be taken as a rule that the finer the cement, all else being equal, the more the sand that can be mixed with it.

Fine grinding has the effect of reducing weight as is shewn by the following table:

10%	residue on a 80 mesh sieve weighed			110 lbs.	per bushel
20%	"	"	"	116	"
25%	"	"	"	121	"
35%	"	"	"	123	"

As to the exact degree of fineness that is advantageous there is some difference of opinion, a 10 per cent. residue on the No. 100 sieve being the minimum test for fineness often advocated.

To test for soundness, that is liability to check or frack, a thin part of cement should be placed on glass, allowed to get hard in air, while covered with a moist cloth, and when submerged in water at 130 degrees Fahr., must show no signs of warping, swelling or cracking. It is characteristic of expansion cracks that they run from the edges toward the centre of the pat and are widest at the edges and narrower toward the centre.

The swelling of cement is always due to defects in manufacture. Cracks similar to those produced by swelling, are also produced when pats or briquettes are placed in water too soon, or before the setting is complete. To prevent this the test pieces are kept in moist air for 24 hours before placing in water.

The tensile test is commonly the one to which most attention is paid, but it is strongly recommended that "Sand Tests" be used as well as neat tests, and furthermore that attention be paid to the proportion of the increase of strength at the various ages. The annexed table gives the results of the tests of cement used recently by the city of Toronto and made under the direction of Mr. Cecil B. Smith.

Brand of Cement.	No. of Samples Tested	Average Specific Gravity	Result of Blowing Test	Residues % Sieves Meshes Per Inch 50	74	100	Tensile Strength Neat 1 week	1 mo.	2 mos.	3 mos.	6 mos.	Tensile Strength 3 to 1 1 week	1 mo.	2 mos.	3 mos.	6 mos.
Belgian White Star	3	3.04	Good	1.3	9.0	12.3	231	311	359	385	...	85	152	176	232	...
English Globe	1	2.94	Good	1.5	6.2	9.4	267	349	415	429	421	115	163	194	231	256
Belgian Josson	1	3.08	Good	.0	8.2	9.0	380	452	506	520	536	91	133	202	215	...
German Dykerhoff	1	3.16	Good	.0	5.0	13.0	430	495	416	515	660	132	178	215	198	...
Belgian Elephant	1	3.00	Good	.0	8.0	11.0	306	320	422	381	...	80	190	215	246	...
German Hemmoor	1	3.08	Good	.0	3.0	15.5	529	474	500	551	570	164	211	220	210	202
German 3 Stars	2	3.07	Good	.25	2.2	5.2	359	442	467	495	456	150	190	262	256	313
Canadian Beaver	4	3.07	Good	.0	.5	2.4	353	397	388	444	471	123	181	249	248	328
Canadian Ensign (Silica)	3	2.98	Good	.0	.0	0.8	346	395	468	488	497	112	177	233	230	254
Belgian White Cross	5	3.05	Poor	1.0	7.4	13.0	360	443	449	520	537	126	169	231	278	321
Canadian Samson	10	3 00	Good	1.0	3.0	4.3	429	489	535	554	559	134	211	251	273	295
Canadian Star (Rathbun's)	41	3.07½	Good	.0	0.6	1.7	459	515	546	568	580	183	247	297	331	358

The specific gravity test is a delicate laboratory test and is one requiring a high degree of care. The object of this test is to determine the density of a cement, that is the sufficiency of the burning, or in other words the soundness, so that the hot-bath test is sufficient.

It is in the power of the manufacturer to produce either a quick setting or a slow-setting cement. A cement which requires two hours or longer to set is called slow-setting and is preferred when it can be used, on account of its greater strength. Soda has been found to produce a marked acceleration in the setting, when added to the neat cement in the proportion of about 1 1-2 per cent but the addition of the soda has the effect of reducing the strength slightly.

For relative values of Portland and Natural cements see tests and remarks under Natural Cements.

The only safe way for an architect to arrive at the value of a cement is to have it tested in a well-equipped cement testing laboratory, where accuracy and proper conditions are scrupulously observed.

From the above remarks it will be gathered that quality in a Portland Cement depends chiefly :—

1. On the proper propoetions of the constituents.
2. On the proper degree and manner of Calcination.
3. On the degree of fineness the "Clinker" is ground.

The market for Portland Cement is increasing very rapidly and the better the material is understood the greater seem the chances of its being used more extensively. The world's production of Portland Cement has been estimateh at 45,000,000 barrels, of which Germany produced about 19,000,000 barrels and the United States over 7,000,000 barselsi The exports in 1898 were as follows :—From Germany 3,096,234 barrels ; from Belgium, 2,495,370 barrels ; from United Kingdom 1,958,550 barrels.

The increase in the production of Portland Cement in the United States in the past 10 years has been most phenomenal, as can be easily seen by the following table :— In 1891, 455,000 barrels ; 1894, 798,000 barrels; 1897, 2,678,000 barrels ; 1900, 7,500,000 barrels. The Portland Cement factories are largely situated in the Lehigh Valley district and about 80 per cent. of the product is now burned in rotary kilns.

The market in Canada has not been large, but it appears to be extending. In 1900 there were 283,124 barrels of Portland Cement made in the Dominion, a large proportion of which is manufactured in the Province of Ontario: The home production is about equal in amount to the imports, and is mostly of a high-grade.

"SALLE DES FETES."

This class of building, which is the subject of designs by Mr. W. S. Maxwell, architect, of Montreal, in the illustrated pages of this number, is conspicuous by its absence in Canada and the States, and is intended for Concerts, State Receptions, Balls, Theatrical Representations, etc.

The floor of the large Hall would be removeable, so that when a reception took place the floor would be level, and when a theatrical representation was in progress this floor would incline towards the stage.

The front portion of the stage is removeable, giving the Hall the form of a true ellipse when so desired.

The first floor has a grand foyer over the main vestibule, and opening off the foyer is a gallery opposite the stage. Large galleries are reached by ample passages, and from the foyer one reaches the open loggia.

The main hall could contain an organ if so desired.

In designing this building the object kept in view has been the providing of a monumental structure, facing upon a Square, and having streets at either side.

THE ARCHITECTURAL LEAGUE OF AMERICA.

Messrs. J. P. Hynes and Wm. Rae, represented the Toronto Architectural Eighteen Club at the annual convention of the League held last month in Philadelphia. These gentlemen were successful in inducing the League to decide upon Toronto as the place of meeting next year.

NOTES.

Mr. Samuel Cabot, of Boston, is sending out to architects and others interested, a new color combination in his Creosote shingle stains.

Mr. W. G. Jones, treasurer, on behalf of the officers and office staff of the Pease Furnace Company presented a gold locket and chain to Mr. James M. Bell, an old and much esteemed employee, who has been appointed its representative in the west.

Four rules of Descartes are given by Viollet-le-Duc for the guidance of the architect. They are briefly : first, never to receive anything as true that cannot be proved : to avoid precipitancy and prepossession : second, to divide each problem into as many parts as possible, or as required for a complete solution : third, to follow a certain order, beginning with objects that are simplest and most easy, and ascending by degrees to the more composite : and last to make such a complete enumeration in every field of enquiry as to insure completeness.

SUGGESTIONS FOR DECORATORS AND FURNISHERS.

A handsome billiard room, decribed by Edward Hurst Brown in the Painters' Magazine, has the walls paneled with flat mahogany panels, scarcely sunk below the level of the stiles and rails. A broad frieze is carried round the room of mahogany, inlaid in a mosaic pattern with white holly. The ceiling is likewise of mahogany, inlaid with holly, the design being a series of rosettes for the border enclosed, in squares, inside of which is a chain pattern. The centre is divided into eight large squares, each of which incloses a large inlaid double circle, with small circles filling up the angles and an intricate interlacing pattern in the centre of each of the larger circles. A broad fire-place, with a border of blue tiles, it at one end of the room, flanked on either side by Ionic columns, which runs up to support the frieze that projects over the mantel shelf. The floor of polished red oak, that has been stained a deeper red, is covered with long Oriental rugs around the handsome mahogany billiard table that is severely simple in its outlines. Upholstered chairs in figured velours occupy the corners of the room, while along the sides are wall chairs with dark blue leather seats. In the window seat is a pile of bright-colored cushions, making it a comfortable place to sit and watch the game. There are no hangings, Holland shades serving to screen off the light.

A dining room in a New Jersey house, that is as much to be commended for its simplicity as for its good taste, has a high wainscot of two-inch moldings, stained with forest green, like all the other woodwork, and finished with a dull luster. A narrow shelf molding caps the wainscot, but is not used for the miscellaneous display of plates and jugs that one is so apt to find there. The upper portion of the wall is hung with a verdure tapestry, having dull green leaves and the large rose-pink flowers of the rhododendron. At the ceiling angle is a five-inch oak cornice molding. A raised plaster stiling about a foot wide runs round the ceiling, the central panel being sunk about an inch. The stile is tinted a deep ivory, while the panel is in ivory white. At one side of the room is a fire-place lined with green brick and faced with Sienna marble. There is very little furniture in the room none that is not necessary, and an entire absence of draperies, except white Holland shades, thus giving an air of spaciousness, lacking in the cultured up style of house furnishing that is usually popular. The heavy square dining table is of forest green oak, severely simple in its lines. The chairs are rush-bottomed, and the sideboard depends more on the good taste of its outlines and the silver and glass displayed upon it than upon any decoration for its beauty. Over the table is an electrolier with an umbrella drapery of flowered China silk, with deep fringe. At the door is a fourfold screen, with panels of stamped leather in bright colors, heraldic devices and quaint pictures of knights and ladies in the style of the old German masters. On the floor is a handsome Oriental rug in green and dull-rose-pink tones.

PERSONAL.

Mr. David Myers, the winner of the Rotch Travelling Scholarship this year, formerly resided in Toronto, Ont.

Mr. Ewart, architect of the Public Works Department, at Ottawa, is on his way to Europe for the purpose of inspecting, in company with Hon. W. S. Fielding, who is now in England, the Royal Mint, preparatory to the preparation of plans for the branch at Ottawa. Mr. Ewart will also visit Edinburgh and Paris, and on his return will inspect the more important public museums in the United States.

Mr. L. McG. Allan, a student in the office of Messrs. Gouinlock & Baker, architects, Toronto, has been awarded the gold medal given annually by the Ontario Government for the best example of drawing and design in architecture at the Central Ontario School of Art and Design. Mr. Allan has been attending the student classes conducted during the past winter by the Toronto Architectural Eighteen Club, and it was on the merits of the work done by him in connection with these classes that the medal was awarded.

AN EFFORT TO SECURE UNIFORMITY IN SIZE OF BRICKS.

A conference was recently held in London between representatives of the Royal Institute of British Architects, the Institution of Civil Engineers, and the Institute of Clayworkers to consider the question of standardizing the size of bricks. There was placed before the conference the following standard suggested by a joint committee of the R.I.B.A. and the Institution of Civil Engineers :

1. The length of the brick should be double the width plus the thickness of one vertical joint.
2. Brickwork should measure four courses of bricks and four joints to a foot.

Joints should be 1-4 in. thick and an extra 1-16in., making 5-16in. for the bed joints to cover irregularities in the bricks ; this gives a standard length of 9 1-4in. centre to centre of joints.

The bricks to be measured in the following manner :—

Eight stretchers laid square end and splay end in contact frog upwards, in a straight line to measure 72 in.

Eight headers laid side by side, frog upwards, in a straight line to measure 35in.

Eight bricks laid, the first brick frog downwards, and then alternately frog to frog and back to back, to measure 21 1-2 in.

This is to apply to all classes of walling bricks, both machine and hand-made, and facing bricks."

Representatives of a number of brick manufacturing firms gade expression to their views, and referred to the difficulty of producing bricks to a standard size—especially as regards length—owing to shrinkage in the kiln. One manufacturer pointed out that to burn the darkest red color it was necessary, or usual, to burn these bricks stood on end, and consequently the weight of the bricks above, and the heat of the fire below, made these oftentimes shrink nearly half an inch in length.

On the other hand the Chairman of the Kent and Essex Brickmakers' Association said the brickmakers were quite capable of making any size or any shaped brick that engineers or architects might require, if architects or engineers would pay the price for it ; but the fact was that the engineer required the very best brick he could get, and he wanted to give the very lowest price for it. Another speaker put this fact in a different way by saying that if a rule were made that bricks were to be a certain length, with no allowance for uncertain contraction, they would have to be sorted, and hence become more expensive.

The conference resulted in the appointment of a committee representing all parties concerned, to consider the desirability of making the size of bricks uniform throughout Great Britain.

In this connection the following table of normal brick dimensions in various countries is of interest :—

	Length ins.		Width ins.		Thickness ins.
United States	8	x	3¾	x	2½
Germany (normal)	9⅞	x	4¾	x	2 1/16
" (north-west)	8½	x	4⅛	x	2¼
" (Bavaria)	11½	x	5½	x	2⅜
Austria	11½	x	5½	x	2 1/16
Italy	9	x	4 1/16	x	2 to 2¾
France	8⅝	x	4¼	x	2⅜
Belgium (Brussels)	8	x	3¾	x	2⅜
" (Liege)	9	x	4⅜	x	2½
" (Boom)	7⅛	x	3⅜	x	2
Switzerland	9⅞	x	4¾	x	2⅜
Russia	10⅜	x	4⅞	x	2 11/16
Holland	8½	x	4⅛	x	2⅛

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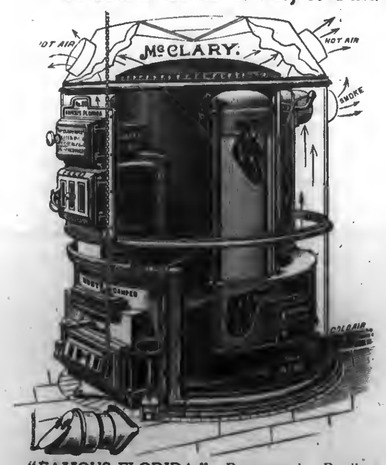

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Contributions of value to the persons in whose interest this journal is published are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

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THE RELATION OF WALL PAPER TO DISEASE.

Some of the Master Painters' Associations of the United States are calling the attention of city councils and local Boards of Health, to the necessity for a regulation forbidding the hanging of wall paper without previously removing the old paper from the wall. Many cases of infectious and other diseases are said to be traceable to the practice of covering up old wall paper with new. There is a regulation in New York which prevents the re-papering without first cleaning the walls, but it applies only to tenement houses. It is no doubt particularly applicable to houses of this character, and if so, would seem to be also necessary in the interests of the public health, for buildings of all kinds where paper is employed as a wall covering. Not only should the old paper be removed from the walls in every instance before new paper is hung, but walls should always be washed with carbolic acid or other disinfectant.

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MANUFACTURES AND MATERIALS

WOOD FIBRE PLASTER.

Mr. W. A. Bradshaw has recently established a factory at No. 109 Front street east, Toronto, for the manufacture of wood fibre plaster, a patent compound, one of the most important ingredients of which is wood fibre, which gives flexibility, toughness, lightness and strength. The advantages claimed for this new plastering material are: that it it quick-setting, proof against disintegration by frost or heat, is a non-conductor, withstands effect of vibration and can be decorated in any manner. For further particulars the reader is referred to the announcement of the manufacturer in the advertisement pages of this number. Twenty tons of this material are being used to plaster the large summer hotel now in course of construction on Lake Rosseau, Muskoka.

The Sackville Freestone Company, Limited, was recently incorporated at Sackville, N.B., with a capital stock of $24,000. The members of the company are Fred. P. Thompson, Fredericton; Andrew M. Bell, Halifax; John W. Lowe, Amelsford; Charles Pickard, Sackville, and P. J. Mooney, St. John.

Protecting iron has been simplified by a Frenchman. The process consists in treating the casting with dilute hydrochloric acid, which dissolves a little of the metal and leaves a veneering of graphite on the iron. The article is then washed in a receiver with hot or cold water, so as to remove the chloride of lime that has been formed.

The Canada Foundry Company have purchased the business of the Dominion Ornamental Iron Company, Toronto, and will conduct it as a Department of their extensive new works now in course of construction at the corner of Davenport road and Mackenzie avenue. It is understood that Mr. Joseph Lea, late manager of the Dominion Ornamental Iron Company, will be in charge of this branch of the Canada Foundry Company's business.

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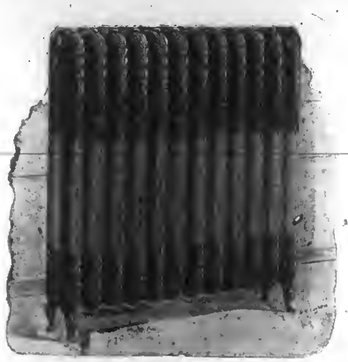

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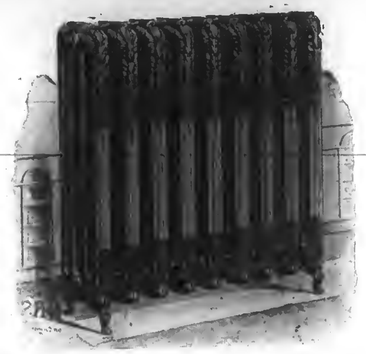

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Steel wool, introduced five or six years ago, is a machine-produced material that is used as a substitute for sandpaper. It is composed of sharp-edged threads of steel, which curl up together like wool, or somewhat as the wood fibres of the familiar material known as excelsior curl up together, though the steel wool is very much finer, the finest of it being not much coarser than the coarsest of natural wools. The steel wool is put up in packages containing 1 lb. each. These are something like rolls of cotton batting, but smaller; 1lb. of steel wool, loosely packed, making, rolled in paper and open at the ends, a package perhaps 15in. long and 2in. or 3in. in diameter.

Made in various degrees of coarseness, steel wool is put to a variety of uses, the finer wools for polishing wood and metal and the coarser for rubbing down paint and varnish. It is often used on special parts of work. While, for example, on the flat surface of a door a man would use sandpaper with a block back for it, for the mouldings he would use steel wool, which fits into the crevices and conforms into irregular shapes. Such work can be done with steel wool far more readily and quickly than with sandpaper and it is used with this advantage on irregular and small surfaces and on carved work.

Besides the steel wool there is coarser material of the same kind called steel shavings, which is put to various uses; as in taking off old paint or varnish, and in polishing wood before painting, and it is used on bowling alleys and on floors for smoothing and cleaning them. Sandpaper clogs in use; steel wool breaks down. The wool is commonly used with gloves to keep the ends from sticking into the fingers.—Woodworker.

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Mr. Thos. Mowbray, of Toronto, one of the unsuccessful competitors in the competition instituted by the Dominion Government for designs for statues of Queen Victoria and the late Hon. Alexander Mackenzie, has entered an action for damages against the Minister of Public Works on the ground that the model which he sent to Ottawa, was seriously damaged as the result of being carelessly and improperly packed by the Government officials.

Brennan vs. Harding & Leathorne.—In this action tried before a jury at London, Ont., on April 12th last, B. was employed by a firm of contractors, and while working in a ditch, at a distance of about ten feet below the surface, was injured by a cave-in. He claimed that the accident was caused by lack of proper "shoring," and that he was injured for life, and sued the contractors for $5,000 damages. The contractors asserted that every precaution had been taken, and that the accident was occasioned by what could not have been foreseen. During cross examination B. admitted that the contractors had treated him well—that they had paid $140 for doctor's bills and hospital charges, and had insisted upon his returning to the hospital after he had left it. B. also admitted that he had gone out of the hospital when the doctor had advised him not to do so, and that he had taken a few drinks, which the doctor told him had delayed his recovery. The jury gave a verdict in favor of the contractors, and the action was dismissed.

Harris vs. Martin.—In this case argued recently before Chief Justice Falconbridge, in the Divisional Court at Toronto, judgment was given on appeal by plaintiff from judgment of County Court of Perth dismissing action for injunction to compel removal by defendant of a gable on his house, overhanging plaintiff's land, and to restrain defendant from permitting water, ice and snow to blow off the roof thereof upon plaintiff's land. The plaintiff and defendant were purchasers of adjoining properties from a common grantor, the plaintiff having purchased in 1891, and the defendant in 1893. The judge below found that the plaintiff's purchase covered all the land up to the wall of the house occupied by the defendant, including the land under the overhanging gable, and that the law, as laid down in Wheeldon vs. Burrows, 12 Ch. D. 31, preventing any implication arising in favor of a reservation by plaintiff's grantor of any easement in derogation of the grant, was subject to exception in the case of easements of necessity, and that the easements of maintaining the gable and allowing the water, ice and snow to be deposited from the roof upon plaintiff's land, were easements of necessity within this exception. Held, that under the circumstances such as here existed, the rights of the grantee are to be found in the terms of his conveyance, subject to an exception in cases of necessity, of so urgent a nature that it would not be possible to conceive the intention of the parties to the contract to be complete without admitting the implication. Assuming, as the judge of the County Court found, and as the plaintiff does not now dispute, that Cornelia Armstrong conveyed to him all that part of lot 17 lying to the east of the brick wall, and there is no necessity compelling the court to imply an intention on her part to reserve to herself the right, inconsistent as it is with the terms of the grant, to maintain a roof overhanging the land conveyed, or a right to cast water and snow upon it. The overhanging roof is not an essential or vital part even of the small building of which it forms part, and it may be removed and other means adopted of disposing of the rain and snowfall without any great difficulty—certainly without so much difficulty as the court would have in assuming a grant from the plaintiff of the rights claimed by the defendant. Judgment below varied by dismissing the claim of the plaintiff as to the portion of lot 17 lying to the west of the line of the east face of the brick wall of the defendant's house, produced in both directions, and by restraining the defendant from trespassing upon the land of the plaintiff being all that portion of lot 17, lying to the east of the said line by maintaining any structure overhanging it, or by shedding snow or water upon it, or otherwise. Plaintiff to have against the defendant the costs of the action, excepting in so far as the costs of the issue with regard to the two and a half feet are concerned, which costs are to be taxed to the defendant; the plaintiff also to have the costs of the appeal.

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Most of the contracts for this important building have been awarded and the excavation work has been completed, about 14,000 yards of earth having been taken out. The contractors, Messrs. Illsley & Horn, have undertaken to complete the building by the first of June next year. All the material is to be complete before it reaches the site, and ready to be put together, the site simply being an assembling ground.

THE CANADIAN PAVILION AT GLASGOW.

The Canadian Pavilion at the Glasgow Exhibition, a small illustration of which appears in the text of this number, measures 180 feet in length by 60 feet in breadth with a floor space of 11,000 square feet. Its appearance is said to be very effective. Messrs. Walker & Ramsay, of Glasgow, were the architects.

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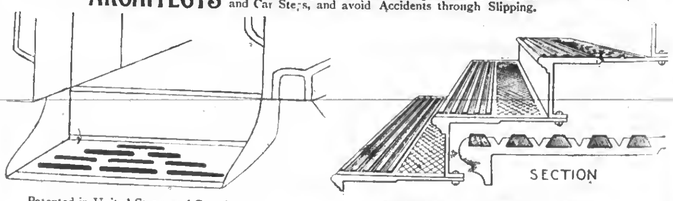

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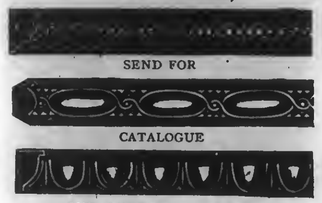

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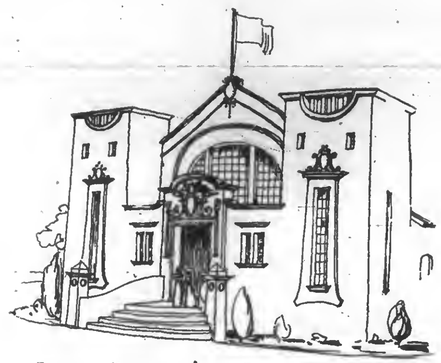
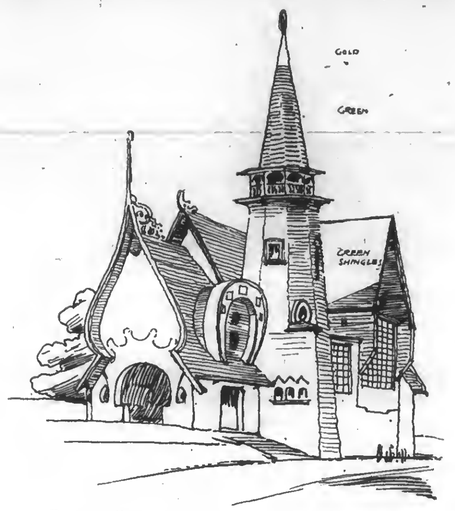
BUILDING CONDITIONS.

There is much activity in building throughout Canada this season. In Winnipeg, the value of new buildings according to the permits issued, nearly doubles last year's record. In Toronto all the architects appear to be busily engaged. Domestic work is calling for a large share of attention. Some important and interesting buildings of this class are in progress, while less costly dwellings are springing up on every hand. The majority are being built as homes by the owners. There is also a considerable amount of speculative building of the better class. It is gratifying to note that the designs for most of this work were prepared by local architects, and in consequence good taste prevails to a much larger extent than in the past, when the builder undertook to be his own architect. The high cost of lumber has undoubtedly retarded building enterprise, and the strikes of workmen in Ottawa and elsewhere are hindering operations and blocking new undertakings.



CANADIAN PAVILION AT THE GLASGOW EXHIBITION.



RUSSIAN PAVILION AT THE GLASGOW EXHIBITION.

RELATIVE VALUE OF FIRE RESISTING MATERIALS.

Some valuable data concerning the fire resisting properties of various materials and methods of construction have been made available by a series of tests conducted in connection with the recent Building Trades Exhibition in London. These tests related to floors, partitions, doors, both of wood and iron, and protective coverings to open spaces. As regards flooring, it was found that by filling up with plaster to the extent of 1 in. the soffit of an ordinary floor having deal joists, a floor was rendered fire-resisting for 45 min. When slag wool was similarly used it stood the test of one hour's duration. A floor made of simple baulks of timber laid side by side, the thickness of the baulks being 9 in., stood an 80 min. test, with a gradual temperature up to 2,000 degrees Fahr. The result was that the under surface of the wood beams was charred to the average depth of about 2in., but beyond this no damage was done. A floor protected by 5in. of concrete was destroyed in 54 min. A simple iron and concrete floor was next tested. After an hour and a half the bulk of the concrete collapsed owing to the deflection of the steel plates. A floor constructed of iron and concrete, in which all the ironwork was embedded, stood a very severe test. The fire did not pass through it, and wood strips imbedded in the upper surface of the concrete were uninjured. With regard to partitions, one formed of terra cotta, wired lathing, covered with plaster of paris, stood a very severe test. It was found that doors of oak and teak stood the most severe test, and with regard to windows it was found that blinds of asbestos cloth were a great protection from the spread of fire.

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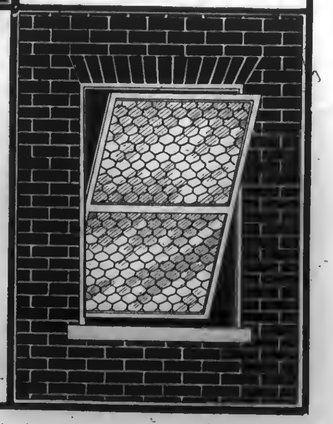

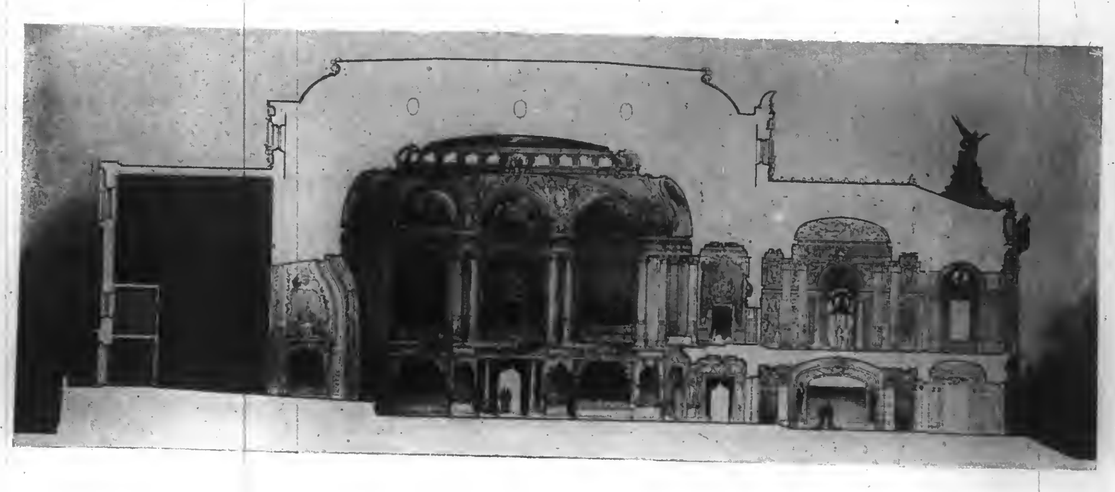

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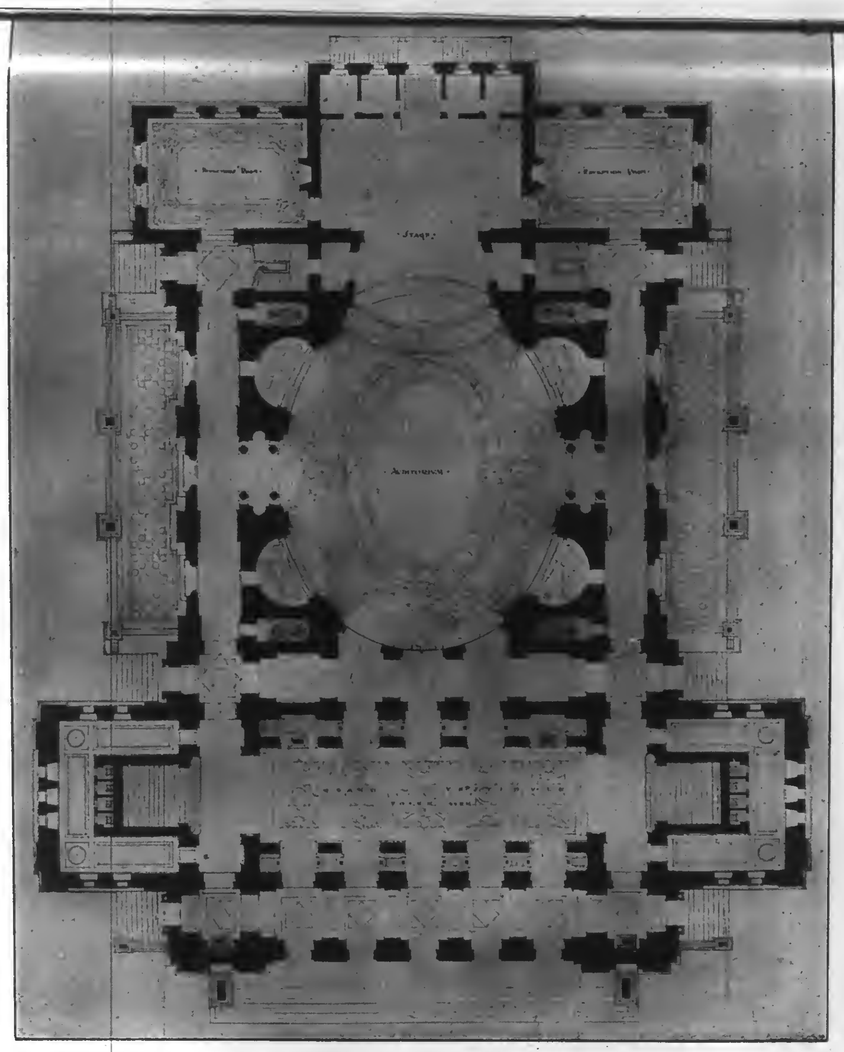

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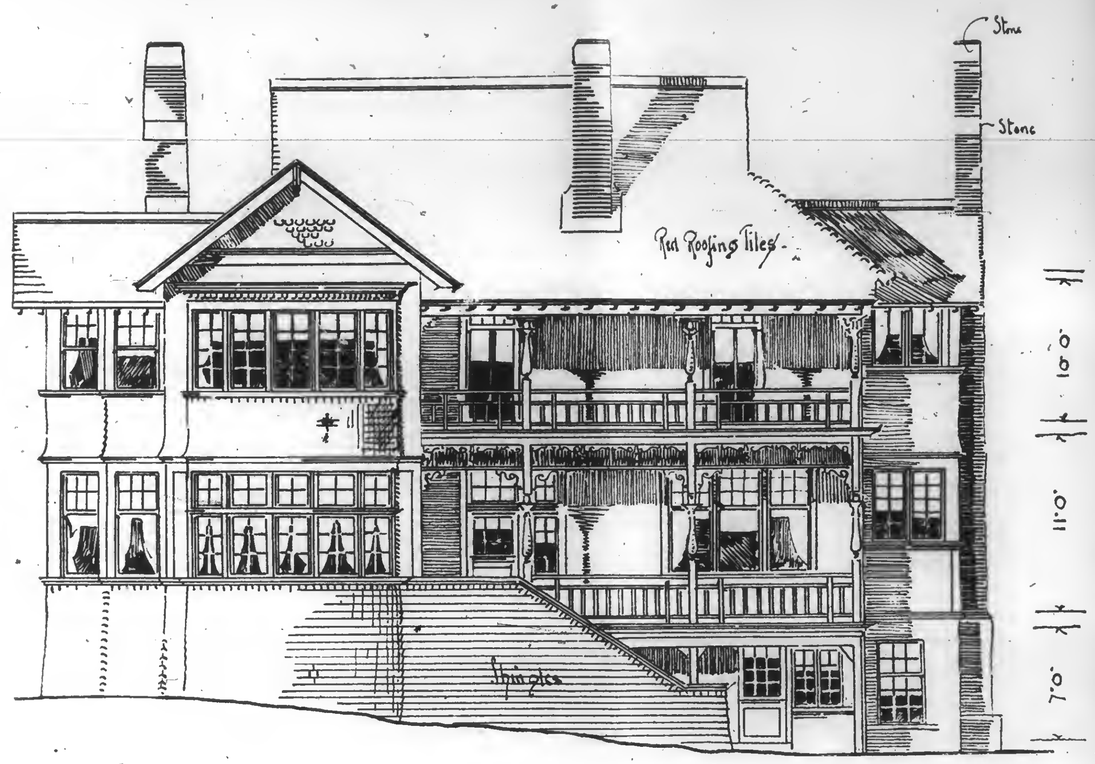

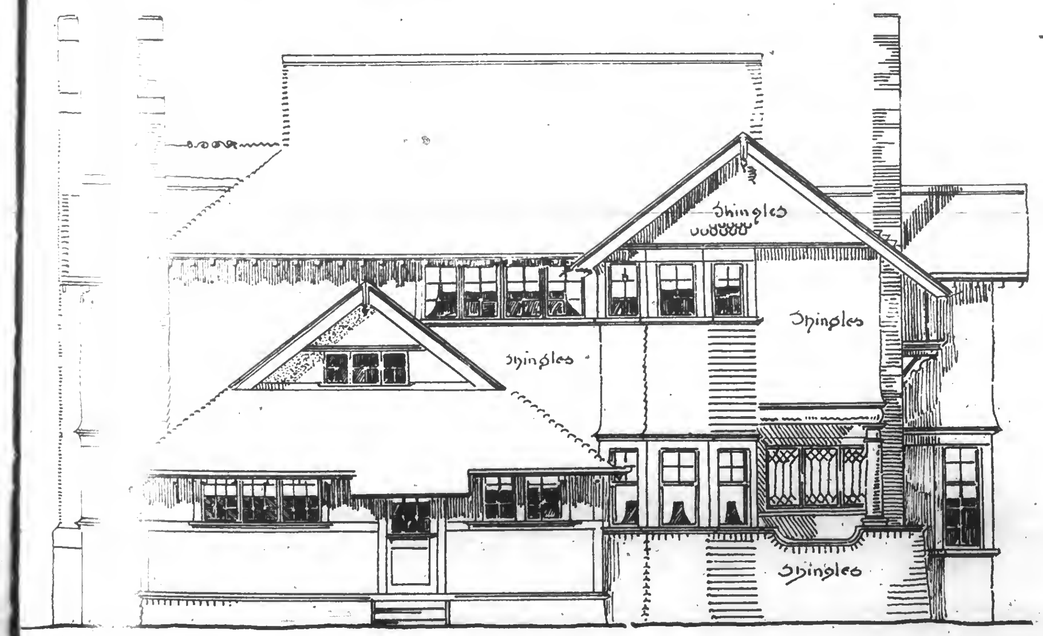

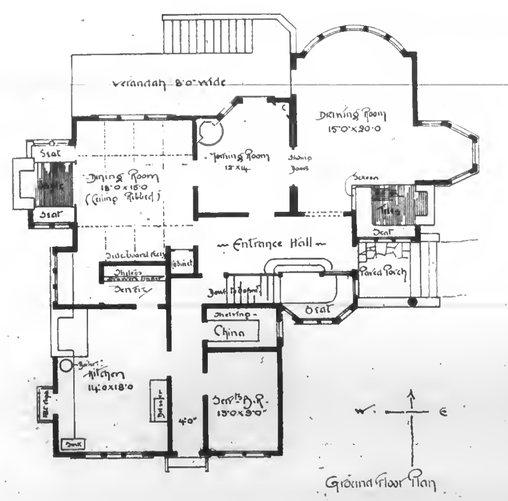

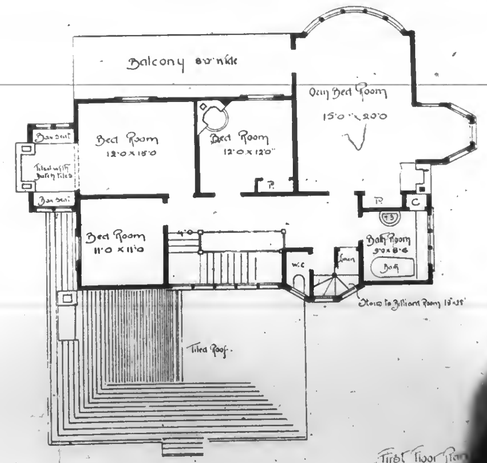

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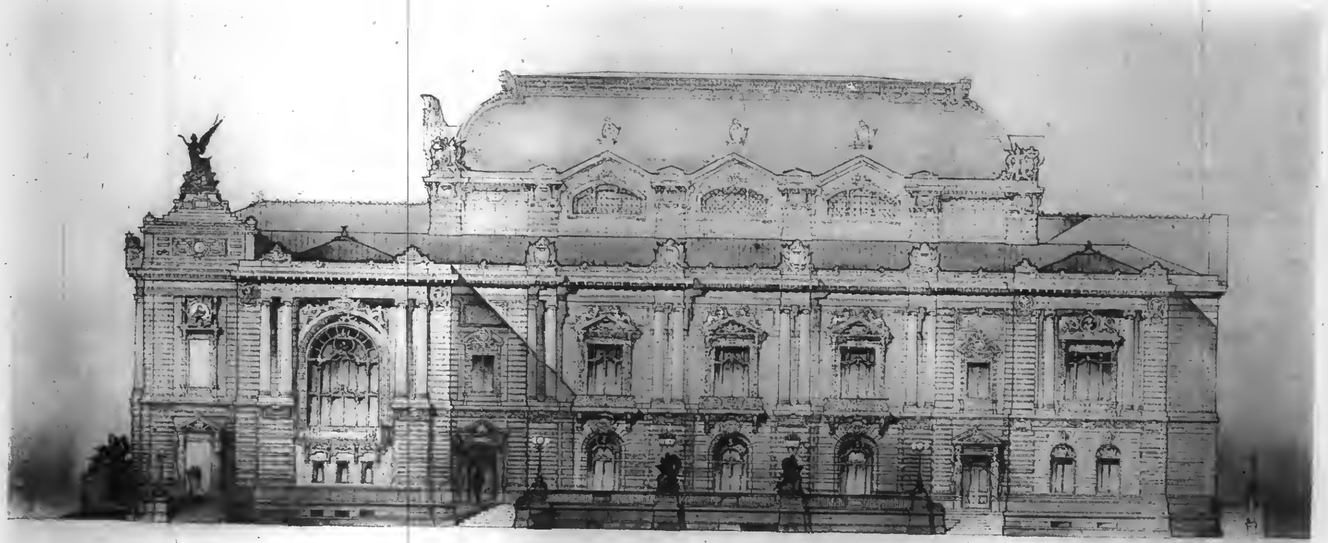

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The Canadian Architect and Builder

VOL. XIV.—NO. 163. JULY, 1901.

ILLUSTRATIONS ON SHEETS.

Competitive Design for Government House, Victoria, B. C., Awarded Second Premium—R.M. Fripp, F.R.I.B.A., Architect.

ILLUSTRATIONS IN TEXT.

Details of a Conical Roof (from the London Building Record.)

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Two Photogravure Plates—Interior Residence of Clarence C. McCuaig, Sherbrooke Street, Montreal—MacVicar & Heriot, Architects.

CONTENTS.

Editorial 133-34-35
By the Way 135-36
Montreal Plumbing By-laws 137-38-39
National Association of Master Plumbers and Steam Fitters of Canada 139-40
Montreal Correspondence 141-42
British Columbia Letter 142-43
Hanging Paper on Ceilings 144

SPECIAL CONTRIBUTORS.

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" S. H. TOWNSEND, " "
" FREDERICK G. TODD, Landscape Architect, Montreal.
" R. A. L. GRAY, Electrical Engineer, Toronto.
" W. H. ELLIOTT, of Messrs. Elliott & Son Co., Toronto.
" J. C. B. HORWOOD, Architect, Toronto.
" A. F. DUNLOP, R.C.A., Architect, Montreal.

A $10,000 Arch.

The Canadian tour of the Duke and Duchess of Cornwall and York will be a great occasion, and it is suitable that we should acclaim it with a lavish display of street decoration; but we cannot help feeling that there is a touch of extravagance about the $10,000 arch which the Manufacturers' Association of Toronto propose to erect as a temporary decoration. It is proposed to offer three prizes, handsome prizes too, for suitable designs for the purpose. The test of excellence in this case is certainly the greatest display for the least money; and it would be a good way of going about the matter, not to invite the outlay of this or any definite sum; but, having secured the location, to offer the prizes for its suitable decoration. There is a limit to reasonableness in temporary decoration, and good taste is within this limit, so that the designer who hits off the pleasing thing will very likely not be the most lavish. In other words, it ought to be understood that though the Manufacturers have voted enough money to cover all needs, the competition is not for the purpose of showing how to spend it all, but in order to establish sufficiency, "an elegant sufficiency." In order to encourage designers to incur the risk of self-restraint (which is notoriously bad policy in a competition) there should be an additional prize offered to the winner, in the form of a bonus, a percentage on the amount saved, given by the Museum Committee, who would of course get the balance. It is for just such a $10,000 gift as this that the Museum project has been waiting. If it were not for that, one would think of the Manufacturers' action only to admire their wealth and liberality. But the readiness with which the glory of the city is forwarded, in a matter of a two days' display, and the difficulty experienced in getting subscriptions for a project which is acknowledged to be necessary for her permanent advantage is remarkable; and one cannot help regretting that it is thought necessary to spend so large a sum upon the temporary erection, when half of it might perhaps do, and the other half go to help on the subscription for the permanent structure.

Toronto City Building By-laws.

For some years past a request for a copy of the building by-laws of Toronto has been met by a statement that there are none because the by-laws are being revised. The by-laws appear to have never existed, except in a fragmentary form, and if this revision, that has been under way so long, is ever completed, the result should be published in the form of a volume containing all the laws and directions which have to be observed in building operations. But they should, above all things, be published soon, or what was revised when the revision began will be out of date. Building operations are at present labouring under the difficulty of laws that are behind the time. Officials, whether as men they know anything or not, as officials know nothing but the law. The

law takes no cognizance of the fact that cement in the mortar of a brick wall is as good as a half brick in thickness; therefore officials are not open to reason upon this point. The law says that a steel beam over a small shop front is fire resisting. Experience points to the superiority of a wooden bressummer; but officials are not open to the argument from experience. The law requires the house trap to be set at such a distance from the house that to connect the weeping tile system beyond it adds extravagantly to the cost of drainage. The law appears to contemplate connecting the weeping tiles behind the house trap in such a way that if the trap is stopped, the whole system of surface drainage must be filled with the backed-up sewage before it can climb high enough to appear in the laundry tubs. It is strange that the plumbing by-law, which is the most modern part of the building law, should contemplate this; but it is stranger still that the officials should want to hold to the law. As a matter of fact the greatest danger is to the authority of the law and the officials; for, when architects know that they are right and the law is wrong, they simply ignore its interference. This state of affairs is unwholesome, and it is time we had a law which can command and enforce respect.

A Regular Size for Bricks.

Architects are complaining of the trouble caused by variations in the size of bricks. It is impossible to figure plans with certainty until the bricks are on the ground. It is not that there is not a standard size, or that the bricks are not made according to it; but simply that the makers use wooden moulds, and do not renew them often enough. A full sized brick is therefore seldom seen, and perhaps the greatest trouble of all is a lot of bricks from a new mould; for calculations based on a slim specimen are more impossible, when full sized bricks are delivered, than a full sized calculation would be for small sized bricks. It is more easy to gain in brick laying than to work down. As far as appearance is concerned, it is hard to err on the side of a fat joint in ordinary brickwork; and, up to likely limits of joint thickness in ordinary work, construction is improved by the necessity which arises for good beds of mortar. But to be obliged to batter down the bricks to meet the figures is something to which both bricklayer and architect object. There is nothing to be done, when a brickmaker has renewed his moulds, and unexpectedly delivers bricks up to the standard, but to re-figure the drawings; and that probably at the height of the season, when there is already too much drawing to do. The remedy is the adoption of a standard size, recognized as part of the building contract; so that brickmakers can only withhold the renewal of their moulds at a risk which would make such economy of doubtful advantage.

Roof Gardens

It seems a little odd that there has not yet been a serious attempt to make use of flat roofs for something more than the purpose of drying clothes. There would be nothing new in having upon one of these roofs, a garden with shrubs and even trees growing in it. The hanging gardens of Babylon may afford us little encouragement, knowing the probable bulk of walling and vault on which they rested; but in later days and nearer home there are examples. The Ducal Palace of Mantua has a dining hall, in the upper or principal storey, with windows opening down to the floor, and looking upon a garden at the same level in which there is a tree between twenty and thirty feet high. This green outlook must have been a beautiful addition to the dining hall in the days when the palace was inhabited. The garden is carried by the vaulting over a wine cellar on the ground floor; not more substantial probably, or more impervious to moisture than the flagged surface of the roof on the Bowling Green Building in New York. One might venture to predict that a restaurant in the comparatively fresh air of this roof, even if it went no further in gardening than orange trees in tubs, would be a formidable rival, for at least six months of the year, to the prosperous affair across the road, into which one decends two levels below the street. One objection to pioneering in this direction is that for a pioneer, surrounded by unimproved neighbours, the surroundings are apt to be squalid. But there are buildings in a favourable neighbourhood, and in a favourable state of isolation, in the case of which such an experiment would be worth trying.

The S.P.S. Building

Prof. Galbraith and his assistants have returned from their tours in search of information to apply to the new building for the School of Practical Science, and yet nothing has been heard from the government as to the appointment of an architect or the arrangement of a competition for this building. The inference is that the plans, upon which the provincial architect was understood to be working before he went on tour with Prof. Galbraith, are the plans of the school. There are two things to be said about this. The first is that the plans which were under way before the tour for information came off, cannot be profited in any fundamental way by the tour. The second is that this is not work that can be so well done in the Provincial Architect's office as out of it. The best thing that can be done with the information the Provincial Architect has gained by his tour is to put it in form for the guidance of the participants in a competition. The sooner the Minister of Public Works understands that in forcing this work through the Public Works Department, he is mishandling the responsibilities of his office, the better. If he does not realize it now he will realize it later when the building is in a position for the public, and the students who will use it, to judge whether the best has been done that could be done. The Minister of Public Works of course knows no more about architecture than he does about ballooning. He is not expected to know anything about architecture; but he is expected to know that the ferment there has been about this building, at the mere suggestion that it should be done in the Public Works' Department, is not for nothing. It is not only architects, but the Guild of Civic Art (moved by persons who are neither artists nor architects) who have taken up the matter. The government have had a fair chance to take up this matter in a large way. The deputation of students was conclusive to show that this province is in competition with the United States to keep her students. It was no case for timidity, and the government seem to have realized that. They had better realize now that it is no case for small dealing in any respect. In the interest of a reputation, which in building matters requires careful handling, let them take steps to get this building done with one thought only—to get the best that is to be got.

Factories Outside of Cities

To any one watching the six o'clock rush out of a large city, the question must occur, is it necessary for all these people to do their work in the same part of the city? Why should all these factory operatives live on the outskirts of the city; coming in every morning in haste, only to go out again in haste in the evening; when their work could be done as well in the suburb where they live? Some factories are located on the railways on the edge of the city and there seems no reason why there should not be a district in each city (preferably eastward in this country, where the prevailing winds are westerly) in which facilities provided by railway concessions would invite the establishment of factories. With the worst disposition of space, such an arrangement would be more convenient than the present manner of concentrating every kind of work in the city. If properly managed, there would be opportunity offered for the growth of little factory settlements in which, after the manner of Messrs. Lever Bros.' village of Sunlight, the labourer would be near his toil and need waste no time in going to and from it. It is not work that is the labourer's curse, but want of leisure; and that he should waste what little time he has, that he can call his own, in going to and from home in the crowded street cars—a journey that will increase in distance continually—is an evil which is not necessary; and to take steps to get over this state of affairs is to do the best thing that can be done to ameliorate the labourer's lot. A couple of hours a day added to their time will with many men be devoted to pursuits producing continual self improvement. Much can result in a few years from a little done each day. There is at least opportunity for the advantage of positive recreation, and the profit of a little gardening. Where nearness to the centre is not all important, the expansion of a city may be considerable, and land not too valuable for a little to go with a workman's cottage.

To Straighten Niagara.

Mr. Joseph I. Keefer has, according to the Buffalo Courier, submitted to the Niagara Falls Commission a plan to cut away a portion of Goat island, build an abutment and "connect the American and Canadian Falls in one grand torrent of water." "My idea," says Mr. Keefer, "is to build a great giant wall or abutment, with a stone top or coping, that cannot be washed away, and let the water from both sides of the island gracefully glide over the dam or stone esplanade, thus making one continuous stream of pure white water from the jut of one shore to the jut of the other." Mr. Keefer explains how this great idea came to him. "I was standing over on the Canadian side where the old British Museum used to be, and, looking across, the thought struck me how much prettier the falls would be if they were not broken by Goat Island." It would be difficult to take this proposition seriously, if it were not that the Commissioners are reported to have already done so. The Commissioners are reported to have "seemed much taken with the idea, and wondered why no one had ever thought of it before." And they are going to have their engineer "figure on it," to ascertain the probable cost. It is a serious fact that public culture is far behind public wealth in the United States, and an atrocity, such as is here contemplated, is always within the possibilities. It would be difficult to persuade a jury of Mr. Keefer's peers that the intrusion of Goat Island is one of the distinguishing beauties of Niagara. His scheme might be attacked on the ground that the unfortunate break in the middle of the Canadian Fall will destroy the perfection of his line, and that the green water in the centre of the horseshoe will forever disturb the prettiness of the "continuous stream of pure white water from the jut of one shore to the jut of the other." Against this petty objection he can urge, as he does, that "the people ought to be interested in this improvement, for it will make a new falls at Niagara. It will stimulate the interest of those who have never seen the falls before, while those who have seen them will be anxious to come again to see what has been done to preserve and improve one of the greatest American wonders." In all this Mr. Keefer shows sound business instinct, and (always supposing that the state of New York can have any reasonable motive for organizing a one lively season of this kind at the Falls) he might add the rush of people both on this continent and from Europe who realize that it is their last chance to see Niagara Falls as the world has hitherto admired it.

BY THE WAY.

THE London Telegraph tells of a squeamish architect who in travelling from Dieppe to Paris, refused to surrender his railway ticket to the guard because the latter's hands were not immaculate, and he declined at the architect's suggestion to cover them with gloves. The case found its way into court, and the architect manfully defended his attitude, but was fined £4.

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IN Berlin there has been founded an institution exclusively reserved for young women desirous of learning the art of painting—not pictures—but buildings. The course of instruction in this school is complete. Not only do the young women learn to handle the brush, mix the colours, but a professor of gymnastics comes twice a day to give instruction in climbing ladders and maintaining one's equilibrium on planks and scaffoldings.

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Mr. Illsley, a member of the firm who have the contract for the erection of the large hotel in Toronto, is given as authority for the statement that the taking down of the old buildings on the site was the speediest bit of work he ever witnessed, either in Chicago or elsewhere. This testimony to Canadian skill and energy, from a contractor of long experience in the United States, where the speediest methods are sought to be employed, is very acceptable, as showing that our contractors are up-to-date.

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THERE is no need for an alien labor law in Budapest Public Sentiment is sufficient to keep out foreigners. In consequence of negotiations having been opened with a firm in Vienna to construct a new national theatre in that town, the majority of the leading actors and actresses have pledged themselves not to accept an engagement in a theatre on which any Austrian architect, builder, decorator, painter, mason, or any kind of labourer had been employed, and a theatre built by the hated foreigners will be rigidly boycotted by nine-tenths of the population of Budapest.

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WITH the incoming of the twentieth century, comes the announcement that the concentrated heat of the

sun's rays has been applied to the burning of bricks. The thing is so simple, says the British. Claymaker. Take a mirror and throw a spot of sunlight on a green brick. It will warm it, say, 15 degrees. Take 1,600 mirrors and throw 1,600 spots of sunlight on a brick. Result, it will warm it 15x1,600=24,000 degrees. What could be simpler, and here we have ten times the temperature necessary to burn a firebrick, without any expenditure but a few bits of looking-glass, which won't wear out!

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I observe that an order has been given to a Montreal firm to decorate and refurnish the residence of the Governor General at Ottawa in view of the approaching visit of the Duke of York. Any money which may be spent in re-habilitating Rideau Hall, or at least the older portion of the building, will be to a large extent thrown away, as the building appears to be almost in a tumble-down condition. Canadians have no reason to feel proud, but rather ashamed, of the executive residence at Ottawa, which does not even compare favorably with the residence provided for the Lieutenant Governor of Ontario. If the country is to continue to have a Governor General and to pay him a large salary, our self respect demands that we shall provide him with a residence in keeping with his position.

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No better indication is required of the change that has taken place within the last two or three years in building conditions in Toronto than the fact that architects are now said to be complaining of the difficulty of securing satisfactory tenders from contractors. The latter are so fully occupied that they are not disposed to go to much trouble to secure the less desirable class of contracts. Only a few years ago the situation was very different. There were then too few contracts going to keep the contractors even moderately well employed, and as a result the competition was far too keen to permit of fair profits being obtained. Another indication of the activity now prevailing is an advertisement in the daily press from the secretary of the Builders' Exchange for skilled mechanics.

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The desirability of establishing one or more centra squares in Toronto is not open to question. It is one of the greatest needs of the city. To my way of thinking it is more essential than the clock and bells recently installed in the hall tower at a cost of about $30,000. If the city could not afford both, the money should have gone towards a lease of the land opposite the new municipal buildings, for the purpose of a public square. The opportunity of securing the land may at any time pass, hence the wisdom of prompt action. While on this subject, I would like to make the further suggestion that land for a public square should be purchased in the part formerly known as St. John's ward, in which the population is the poorest and most congested. As a means of improving the physical and moral status of the district, it should prove a profitable investment.

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What is known as the Art Renean, which probably had its origin in France, is the dominating characteristic of decorative work in Europe to-day. Its chief feature is perhaps following lines. In wall papers, the new style, which combines grace in design with skilful color combinations, has displaced the gaudy patterns which were lately so much in vogue and which had so little in the way of true artistic merit. Some excellent examples of decoration in the new style—the work of Scotch and English firms—are to be seen at the Glasgow Exhibition. The chief feature of this Exhibition, however, is said to be the magnificent colletion of paintings in the new permanent Art gallery. The temporary Exhibition buildings, are heavy in appearance by comparison with those of the Pan-American Exhibition, and to a Canadian their effect is less pleasing, but considering the eminently practical and substantial character of the city and people, it was to be expected that these buildings would in some measure reflect their surroundings.

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In a recent conversation with Mr. W. H. Elliott, of Toronto, who has lately returned from a three months European tour, I gathered some impressions concerning matters artistic abroad. Regarding Italy, the principal cities of which he visited, Mr. Elliott states that the land which was once the home of the greatest artists, would now be devoid of artistic interest but for the works of the old masters. Strange, is it not, that there are no great Italian artists of the present day, and Italy is making but feeble and unsuccessful attempts to keep pace with modern progress in art, so far at least as the fine arts are concerned? In applied art she is more successful, as witness her exhibit at the Paris Exhibition last year. The character of present day Italian Sculpture, of which the production is considerable, bears witness that the genius which inspired the Italian artists of a former period, no longer exists. The conception and spirit of the true artist are wanting. The work of the present day is mechanichal, commonplace and without interest.

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A storm of indignation was recently aroused in Hull by a new building by-law, which, with the view of preventing the recurrence of the disaster of last year, prohibits the erection of wooden dwellings. Several hundred citizens waited on the city council recently, demanded that the by-law be repealed, and hissed the mayor and aldermen. The mayor appointed a time to receive a deputation, representing the citizens, and to hear and consider their views. There can be no doubt that the restrictions imposed by the by-law will be burdensome upon the many owners of cheap properties, but that should not be allowed to stand in the way of enactments which are necessary to the preservation of property of vastly greater value. The proximity of Hull to the Dominion capital should be considered. The council of Ottawa is probably powerless to protect itself against danger from an adjoining municipality, but in the event of such adjoining municipality neglecting or refusing to adopt regulations for its own protection and that of its neighbor, the provincial or federal government might not unreasonably be asked to pass special legislation dealing with the case. If the property owners of Hull cannot afford to put up buildings other than those of the most hazardous character, they should be prepared for the sake of general welfare to live outside city limits, which, in these days of rapid electric transit, is no hardship, but on the contrary, is by many city people counted a privilege.

MONTREAL PLUMBING BY-LAW.

Following are the full provisions of By-Law No. 215, of the City of Montreal, concerning plumbing and the drainage and ventilation of buildings, as adopted by the Council of that city on June 12th last:—

Sect. 1.—No person, firm or corporation shall, after the first of September, 1901, engage in or work at the business of plumbing, either as a master or employing plumber, unless such person, firm or corporation, has received a license or certificate therefor in accordance with the provisions of this By-law relating to these as hereinafter contained.

(1) The word "Master Plumber," as used in these regulations, shall be deemed to mean one who employs practical plumbers or journeymen plumbers, and who keeps a shop or place of business for which he is held to pay a business tax to the city.

(2) Any person engaged in or working at the business of plumbing, prior to the passing of this By-law, and desiring to engage in or work at said business, either as a master or employing plumber in the City of Montreal, shall on or before the first of September, 1901, apply to the Board of Examiners hereinafter provided for, to be examined as to his qualifications for such business.

(3) In case of a firm or corporation, the examining and licensing of and granting a certificate to any one member of the firm or the manager of the corporation, shall satisfy the requirements of this By-law.

(4) There shall be a Board of Examiners of plumbers, consisting of the Building Inspector or his assistant, the Sanitary Engineer (who shall be a member of the Board ex-officio), and a licensed master plumber of at least ten years practical experience, to be appointed by the City Council, for the term of two years at a time. Said third member to receive as compensation for his services a sum not exceeding five dollars a day of actual service.

(5) The said Board of Examiners shall then appoint a chairman, and designate the time and place for the examination of all applicants desiring to engage in the business of plumbing within the City of Montreal. Said Board shall examine said applicants as to their practical knowledge of plumbing, house drainage, and plumbing ventilation, and shall submit the applicant to some form of practical tests, and if satisfied of the competency of the applicant, shall so certify and issue a license, authorizing him to engage in the business of plumbing in Montreal, either as a master or employing plumber.

(6) The fee for a license shall be five dollars for a master or employing plumber, and said license shall be renewed yearly, on the payment of one dollar.

PLUMBING, DRAINAGE AND VENTILATION OF BUILDINGS.

Sect. 2.—Every master plumber shall be required to register his name and place of business at the office of the Board of Health, and to give notice at the said office in case of the removal of his place of business.

(1). An official list of such plumbers, recognized by the Board of Health, shall be posted, once a year during the month of May, and copies thereof shall be furnished to those who may ask for the same.

(2). It shall be unlawful for any person to carry on the trade of plumbing in the City of Montreal, unless licensed or registered as above.

(3). Every licensed master plumber shall be held responsible for all the acts of his agents or employees, and any licensed plumber who neglects or refuses to comply with the provisions of this By-law, may have his license suspended or cancelled by the Board of Health, in which case he shall be barred from obtaining a permit to do any work during such length of time as the said Board may deem proper.

Sect. 3.—All plumbing and house drainage, and ventilation in the City, shall be made and constructed in accordance with the following rules, which shall be binding on all parties concerned.

(1). No drains shall be made, or plumbing work done in any building, until a permit to do so has been obtained from the Sanitary Engineer.

(2). No alteration of drains or plumbing work in any building affecting its sanitary condition shall be undertaken before giving notice to the Sanitary Engineer. Forms of application, and specification for the drains and plumbing work of a new building and for alteration of the same in old buildings, will be supplied by the Health Department.

(3). Pipes, drains and plumbing work shall not be covered or concealed from view, until approved by the Inspector of the Board of Health, who shall examine the same within two legal working days, after notice that they are ready for inspection.

(4). The material used shall be of good quality and free from defects, and the work shall be executed in a thorough and workmanlike manner.

Sect. 4.—The arrangement of the soil, waste and ventilation pipes shall be as perpendicular and direct as possible.

(1). The soil, drain, waste and drain ventilation pipes shall be exposed to view, ready for inspection and for convenience in repairing.

(2). When necessarily placed within partitions or recesses of walls, soil, drain, waste or ventilation pipes shall be covered with woodwork, so fastened with hinges or round headed screws, as to be readily uncovered.

Sect. 5.—Every house or building shall be separately and independently connected with the street sewer, in front of such house or building, or with such other sewer as shall be designated by the Board of Health.

Sect. 6.—Interior house drains when above ground shall be of extra heavy cast iron pipe. When laid under ground, drains shall be of cast iron or vitrified clay pipe, and shall have a fall of at least 1-4 inch to the foot. Where water-closets discharge into them, the pipes shall be at least four inches and not more than six inches in diameter and be laid in a straight line if possible. All changes in direction shall be made with curved pipes when of cast iron, and with Y pipes when of vitrified clay; and at least one clean-out length shall be provided at each change of direction.

In all cases of soft ground, vitrified clay pipes must be laid upon at least four inches of concrete.

Sect. 7.—No bricks, sheet metal, earthenware, or chimney flue, shall be used as a sewer ventilator, or to ventilate any trap, drain, soil or waste pipe.

Sect. 8.—Soil pipes shall be of cast iron of the weights specified in section 15 and shall extend at least 2 feet above the highest part of the roof, or coping, undiminished in size, and in no case shall they be less than 4 inches in diameter; where the soil ventilating pipes come within 15 feet of any windows, open lauvres, or other openings, they muse be carried up 5 feet above top of such window or opening.

Soil, waste and vent pipes, in an extension, shall be carried above the roof of the main building when they are closer than 20 feet to the windows of the main building.

Sect. 9.—All traps shall be adequately protected from syphonage or air pressore, by vent pipes of a size not less than one and a half inch in diameter vented by the open air through the roof, unless where antisyphon traps or other approved devices are used.

Sect. 10.—Joints of sewers and soil pipes shall be gas and water tight.

Sect. 11.—When stacks of pipe are required for sinks only, they shall be carried through the roof and be not less than 2 inches for 4 sinks or 3 inches for over that number; but the portion above the roof, in all cases, must be 1 inch greater diameter than that below the roof.

Sect. 12.—When lead pipes are used to connect fixtures with vertical soil or waste pipes, or to connect traps with vertical vent pipes, they shall not be lighter than 6 lbs. sheet lead to the square foot. All such pipes shall be properly supported to prevent sagging.

Sect. 13.—There shall be no traps in connection with vertical soil or waste pipes.

Sect. 14.—All pipes shall be sound and free from holes or cracks.

Sect. 15.—The following weights per lineal foot, for cast iron and lead pipes, are the minimum weights :

IRON PIPES.

(Interior measurement)

For Plumbing Work.

2 inch 4 pounds per lineal foot.
3 inch 6 1-2 pounds per lineal foot.
4 inch 9 pounds per lineal foot.
5 inch 12 1-2 pounds per lineal foot.
6 inch 17 pounds per lineal foot.

For Drain Work.

4 inch 13 1-2 pounds per lineal foot.
5 inch 17 pounds per lineal foot.
6 inch 20 pounds per lineal foot.

Lead Pipes.

1 1-4 inch 1 1-2 pound per lineal foot.
1 1-2 inch 2 pounds per lineal foot.
2 inch 2 1-2 pounds per lineal foot.
2 1-2 inch 4 1-2 pounds per lineal foot.
3 inch 5 1-2 pounds per lineal foot.
4 inch 7 pounds per lineal foot.

For Waste Sink Pipes.

2 inch 10 pounds per lineal foot.
3 inch 15 pounds per lineal foot.

(1). Iron pipes shall have their weight stamped upon them.

(2). Leadwaste pipes, bends or cess-pools, shall be equal to not less than 6 lbs. per square foot of sheet lead.

(3). The fittings used in connection with such pipes shall correspond with them in weight and quality.

Sect. 16.—Plumbing work shall not be used unless the same has first been tested in the presence of the Sanitary Inspector, or his representative, with the water test, or if that is not practicable, with the peppermint, smoke or other reliable test, and if said test is satisfactory, he shall issue a certificate to that effect.

(1). The Water Department, for the purpose of such test, shall temporarily turn on the water, and shall only permanently turn on the water when the certificate of the Inspector is produced.

(2). When defective pipes are discovered, they shall be removed and replaced by sound pipes ; defective joints shall be made tight, and every part of the work in which defects are found, shall be made to conform to the present rules.

Sect. 17.—Joints in iron drain, soil and waste pipes, shall be filled with oakum and lead, and hand caulked so as to make them gas tight, anh they shall not be painted, varnished, tarred or puttied ; the said joints may also be screw joints ; should the work prove to be satisfactorily executed, the Sanitary Inspector shall grant a certificate to that effect to the person concerned.

Sect. 18.—All connections of lead with iron pipes, shall be made with a brass sleeve or ferrule of the same size as lead pipes, which shall be carried inside the ferrule, put in the hub of the branch of the iron pipe and caulked with lead ; and the lead pipe shall be attached to the ferrule by a wiped joint.

All connections of lead pipe shall be by wiped joints.

Sect. 19.—No tile pipe shall be connected with the soil or waste pipe, unless the same be provided with a flange to admit of a proper connection being made.

Sect. 20.—Every water-closet, urinal, sink, basin, washtray, bath, and every tub shall be separately and effectively trapped. This rule shall apply to a set of tubs, but only one trap shall be required for the set.

(1). Traps shall be placed immediately next to the fixtures, and in no case shall they be distant more than two feet from the fixtures.

(2). There shall be only one trap under the water-closet and that immediately beneath the same.

Sect. 21.—The connection between iron and tile pipes shall be made with the best cement, or by any other means approved by the Inspector.

Sect. 22.—Sinks shall be provided at the inlet of such fixtures, with strong metallic strainers to exclude from such waste pipes all substances likely to obstruct them.

Sect. 23.—In no case shall the waste pipe from a bath, tub or other fixture be connected with a water-closet trap.

Sect. 24.—Overflow pipes from fixtures shall in every case be connected with the inlet side of the trap, and above the water.

Drip or overflow pipes from the safety pan under water-closets and other fixtures, or refrigerators, or from tanks, other than those of water-closets, shall be made to run into some place open to sight ; and in no case shall any such pipe be connected directly with the drain, waste or soil pipe.

Sect. 25.—Each water-closet apartment shall be ventilated by means of a shaft or air duct which shall start with not less than 4" diameter and increase one inch as it passes each successive flat and extend at least three feet above the roof and have a suitable cap.

(1). Each water-closet apartment shall be ventilated by means of a shaft or air duct, which shall be at least two inches in diameter in rising from the lowest flat, increasing one inch through each successive storey, but must not be less than four inches, in going through the roof, beyond which it must project at least three feet, and be insulated.

(2). Ventilation may be made through a flue, provided there be no openings in such flue to rooms above, other than for ventilation of water-closet apartments.

Sect. 26.—Every water-closet shall have a cistern supply and in no case be supplied directly from the city reservoir supply pipes.

Sect. 27.—In houses containing one, or more than one tenement, there shall be one water-closet for each family, and a separate cistern for each closet ; in other buildings, however, a group of closets may be supplied from one tank ; and there shall be at least one water-closet to every fifteen inmates.

In buildings where operatives of both sexes are employed, proper separate accommodation shall be furnished for men and women.

Sect. 28.—The overflow pipes from water-closet cisterns shall dischatge into an open sink, or the basin of the water-closet, or where its discharge will attract attention, and indicate whether waste of water is occurring, but not into the soil or waste pipe, or into the drain direct.

Sect. 29.—Valves must be so fitted and adjusted as to prevent wasting of water.

Sect. 30.—No privy pit or cesspool for sewage shall hereafter be constructed within the city or any premises situated within 200 feet of any street wherein there is a sewer and wherein the city water is laid ; nor shall privy pits or cesspools for sewage, presently existing, be henceforth permitted, after May 1st, 1902, to remain in any part of the city where water-closets can be connected with a public sewer in the streets.

Proviso. The Health Department may, however, in exceptional cases, issue written permits for the toleration (during a period not exceeding twelve consecutive months renewable) of privy pits and cesspools for sewage where the nature of the case would make the rigid enforcement of this By-law a detriment to the public health. In all such cases, the following shall be the method of procedure :

1. The owner or agent of any premises, whereon it is desired to tolerate for a limited period a privy pit or cesspool for sewage, shall fyle, during the month of April each year, a demand in writing upon the Health Department for a temporary permit, alleging therein the grounds whereon exception is demanded.

2. The premises in question shall forthwith be inspected by an officer of the Health Department, who shall make a written report concerning the same, to the Medical Health officer upon the following matters :

a. As to the validity of the reasons advanced by the applicant for the exemption from the general law ;

b. As to the construction and condition of the privy pit or cesspool for sewage for which the permit is asked.

3. Upon the receipt of the aforesaid report, the Medical Health Officer, if, in his opinion, the strict enforcement of this law would be detrimental to the health, and

it the condition of the privy pit or cesspool for sewage, for which toleration is demanded, is in conformity with the following article, may issue the temporary permit hereinabove mentioned.

Sect. 31.—Every new privy pit shall be water-tight, of a capacity of 45 cubic feet ; the sides and bottom shall be constructed of cemented brick twelve inches in thickness and well cemented inside with hydraulic cement ; such vault may be constructed of cast iron, the shape or form of which shall be either circular or oblong without angles, and with a concave bottom ; it shall be provided with a ventilation pipe at least 4 inches in diameter, extending from the pit through the roof sufficiently high as to prevent inconvenience to occupants of neighboring houses ; the seats shall have a tight-fitting cover; it shall have an aperture opening exteriorly to allow of cleaning by pneumatic process, such aperture to be two feet by one and a half feet in size ; or else the flooring shall be air-tight and shall have a tightly fitting trap-door comminicating with the pit ; the top of the vault shall be one foot above the level of the ground ; nothing shall be put into such pit, excepting human excreta ; privies shall be located at a distance of 20 feet or more, should the Board of Health deem it necessary, from any house or street ; they shall be emptied when the contents reach within eighteen inches of the top of the vault or whenever the Board of Health deem it necessary ; no offensive smell or gases shall be allowed to escape therefrom. But, in no case shall a privy be allowed within a dwelling-house.

(1). In the case of privy vaults now drained into a common sewer, they shall be isolated by means of suitable traps placed below frost and according to instructions from the Board of Health.

(2). In the case of a new house being built, or one already existing being repaired, wherever there is a public sewer in the street, a water-closet shall be put in, to the exclusion of privy pits.

(3). When a house is occupied by but one family, if there is already a water-closet in the house, no privy pit shall be tolerated on the premises.

Sect. 32.—No steam exhaust blow off pipe shall connect with a sewer directly, or any house drain, soil pipe, or waste pipe ; such pipe must first discharge into a tank or condenser.

Sect. 33.—Cellars shall not be connected with the house drain, unless by a branch pipe, and by special permission of the Department, and according to plans approved of by the Department.

Sect. 34.—A sub soil drain shall be provided when absolutely necessary, and shall be constructed and trapped to the satisfaction of the Department .

Sect. 35.—No trap shall be permitted between the house drain and the public sewer, unless such trap shall have a hand hole for cleaning purposes, and a fresh air inlet pipe, the whole as may be decided upon by the Department.

Sect. 36.—Drains in yards shall, in all cases, be trapped below frost, that is to say : four feet at least under ground.

Sect. 37.—The inspection of drains on private property shall be under the exclusive control of the Department.

Sect. 38.—Gas companies are obliged to place a stop cock to every main pipe.

Sect. 39.—Any person contravening any of the provisions of this By-law, shall be liable to a fine with or without costs, and in default of immediate payment of the said fine with or without costs, to an imprisonment ; the amount of said fine, and the term of said imprisonment to be determined by the Recorder's Court, at its discretion ; but the said fine shall not exceed forty dollars, and the term of imprisonment shall not exceed two calendar months ; the said imprisonment, however, to cease at any time before the expiration of the period fixed by the Recorder's Court, on payment of said fine or fine and costs ; and where the infraction is continuous, such infraction during each day shall constitute a separate offence.

This By-law will go into operation on the first of September next.

NATIONAL ASSOCIATION OF MASTER PLUMBERS AND STEAMFITTERS OF CANADA.

The sixth annual convention of the above Association was held in the Temple Building, Toronto, on June 26th, 27th and 28th. The chair was occupied by the President, Mr. W. H. Meredith, of Toronto. The following persons were in attendance at the meeting :—Thomas Moll, Ald. Lamarche, Capt. Joseph A. Giroux, Thomas Christie, John Watson, Montreal ; H. Hogarth, W. Mansell, W. H. Meredith, J. B. Fitzsimons, K. J. Allison, W. J. McGuire, George Cooper, Alex. Fiddes, J. H. Wilson, R. Ross, Alex. Purdy, J. J. McKittridge, Toronto ; F. G. Johnston, John McKinley, H. A. Knox, Ottawa ; H. Mahoney, Guelph, Ont.; John H. Neelands, Barrie, Ont.; Frank Powers, Lunenburg, N.S.; James Boxall, Lindsay, Ont.; Adam Clark, J. Wallace, A. Rogers, Hamilton ; Peter Shiells, Kincardine, Ont.; George Ross, Brockville, Ont.; S. King, Ingersoll, Ont.; James Pennington, Windsor, Ont.; W. Sievewright, Petrolia, Ont.; Charles T. Bull, James Williams, St. Thomas, Ont.; M. B. Squires, Windsor, Ont.

On behalf of the City Council the delegates to the convention were welcomed to the city by Aldermen Cox and Loudon, of the reception committee of the City Council. Mr. James Wilson, President of the Toronto Association, also extended a welcome to the visiting delegates. Mr. Hogarth, Chairman of the Reception Committee of the National Association, introduced the following gentlemen representing the supply interests : Messrs. Fred. Somerville, W. C. Allen, Chas. W. Chandler, Alexander Fleming, Ontario Lead & Wire Company ; Charles J. Britain, James Morrison Brass Mfg. Co.; A. A. McMichael, Andrew Mann, E. A. Rogers, The James Robertson Company ; W. L. Helliwell, T. B. Alcock, E. J. Brewer, Gurney Foundry Company ; Andrew Taylor and W. Taylor, Dominion Radiator Company ; H. W. Anthes, Toronto Foundry Company.

In response to the request of the President several of these gentlemen addressed the convention, wishing the Association success in its work and expressing the hope that its deliberations would result to the advantage of the trade as well as of the supply houses. Mr. J. J. McKittrick made the suggestion that the Association should draw up a model plumbing by-law for the guidance of the municipalities throughout the country.

The President in his report referred to the good feeling existing between members of the Association and the manufacturers and jobbers. He pointed out the necessity for systematic organization and the appointment of a permanent secretary who should devote special attention to this work. The difficulty in the way of carrying out this suggestion was to secure the necessary funds. The necessity of educating the members of the Association to do first-class work at a fair price and to avoid underbidding each other was also touched upon. The President expressed the opinion that the greatest evil in the plumbing trade to-day is over-keen competition among bidders, resulting in scamp work.

The Vice-President, Mr. John McKinley, in his report drew attention to the neglect on the part of city councils throughout Ontario to adopt proper plumbing and sanitary by-laws. This neglect, he claimed, was due to defects in the provincial laws. He suggested the appointment of committees to see that these defects are remedied, so that it will not be possible as at present for unskilled persons to engage in plumbing work.

Mr. Frank Powers, Vice-President for New Brunswick and Nova Scotia, reported that the past year had been a prosperous one for the plumbers in the Maritime Provinces, and that the present outlook was promising. He stated that well-founded complaints had been made against the supply houses for selling to consumers, and suggested that the Association devise means for dealing promptly with cases of this kind. To this end the formation of Provincial Associations was recommended. The benefits which would accrue from the formation of such Associations would be an increase in the membership of the National Association, the privilege to members of attending quarterly meetings, the securing of sanitary

legislation applicable to the towns as well as the cities, and the removal of any jealousy which may exist between the master plumbers in the city and country. The report stated that a Local Association of Master Plumbers would probably be formed at an early date at Sydney, C. B.

The report of the Secretary, Mr. W. L. Mansell, contained the following list of places where Master Plumbers' Associations exist, together with the membership in each case:—Halifax, 21 members; Sydney, C.B., St. John, Fredericton, Quebec, Ottawa, Kingston, Hamilton, St. Catharines, 12 members; Montreal, 34 members; Toronto, 23 members; Windsor, London, 9 members; St. Thomas, 2 members; Guelph, in affiliation with Toronto, 1 member; Sarnia and Chatham in affiliation with Windsor, 1 member each; Winnipeg, 8 members; Vancouver, 11 members; Barrie, in affiliation with General, 1 member.

The report stated that the local Associations were in a prosperous condition, and that good feeling prevailed between the Associations and the manufacturers.

Mr. Jas. Pennington, as Vice-President for Ontario, expressed regret that it had been found necessary to discontinue the publication of the "Bulletin," and asked whether it would not be possible to charge a subscription of $1.00 per year. It was suggested also that the travellers representing the supply houses should be furnished with literature by the Association for distribution to the plumbers throughout the country, urging them to become members.

The various reports were referred to the Committee on Resolutions.

Messrs. F. Powers, Joseph Pennington, F. G. Johnston, John Watson, W. Mansell and John McKinley were appointed a committee to consider and report regarding the advisability of forming Provincial Associations.

At the evening session the Committee on Resolutions reported recommending that the question of appointing a permanent secretary be referred to a select committee; approving of the suggestion of Vice-president McKinley for the appointment of a committee to consider grievances, as well as his recommendation regarding Provincial Associations and sanitary laws, and suggesting the appointment of a select committee to consider and report on the first of these recommendations. It was recommended that the report of the Vice-President for Nova Scotia be adopted, also the report of the Legislation Committee, and that the report of the Vice-President for Ontario be referred to a select committee.

The Apprenticeship Committee's report recommended that an apprentice should serve five years before being recognized by the Association as a journeyman; that all present and future apprentices shall receive at the end of their apprenticeship term a certificate of the Association from their employer as a proof of their ability, and that the matter of their wages be referred to the Local Association for adjustment. After some discussion the report was adopted.

A motion by Mr. Powers that a committee be appointed, consisting of three members from each province, to consider the question of sanitary laws and endeavor to secure the enactment of such laws, was adopted.

Mestrs. Allison, Fitzsimmons and Mahoney were appointed a committee to report with regard to the advisability of appointing a paid secretary.

At the morning session on the second day, Alderman Lamarche, of Montreal, addressed the convention and explained the leading features of the new plumbing by-law, which has recently passed the Council of that city and will go into operation on September 1st.

The Committee re the appointment of a permanent secretary reported recommending that the appointment be made at a salary of $200 for the first year. After some discussion action upon the report was deferred until the following day.

On the adjournment of this session at 1.40 p.m., the delegates were given a carriage drive to points of interest in the city as the guests of the City Council.

In the evening the Annual Association Banquet took place at McConkey's restaurant, and notwithstanding that the weather was uncomfortably warm, was largely attended. The chair was occupied by Mr. J. H. Wilson, President of the Local Association, having on his right the President of the National Association, Mr. W. H. Meredith, Alderman Wood, Alderman Lamarche and Mr. H. W. Anthes, and on his left Mr. A. E. Kemp, M.P.; Mayor Howland, Mr. Edward Gurney, Mr. J. H. Patterson, Mr. Andrew Mann and Mr. Alex. Saunders. Messrs. Kemp and Gurney responded to the toast, "Our Country and its Manufacturing Industries." Mr. Meredith, Alderman Lamarche and Mr. Frank Powers replied in suitable terms to the toast, "Our Guest—the National Association," proposed in a humorous speech by Mr. Anthes. "The Mayor and Corporation," brought a response in French and English from Mayor Howland. "The Manufacturers and Supply Trade," brought responses from Messrs. J. H. Patterson, Adam Taylor, H. W. Anthes, Alexander Saunders, Alexander Fleming, T. B. Alcock, Charles Morrison and Andrew Mann. Mr. Grant Helliwell, President of the Ontario Association of Architects, and Mr. Robert Harrison, President of the Journeymen Plumbers' Association, replied on behalf of "Sister Associations." The "Local Master Plumbers," proposed by Mr. Frank Powers, of Lunenburg, N.S., was responded to by Messrs. J. J. McKittrick, J. H. Wilson, and K. J. Allison, of the Toronto Association. Captain Giroux replied on behalf of "The Ladies." A pleasing feature of the evening's proceedings was the presentation of a gold ring set with diamonds and bearing the masonic emblem to Mr. Fiddes, in recognition of the many valuable services which he has rendered for years past to the Local as well as the National Association.

At the Friday morning session Messrs. John Watson, Montreal; Frank Powers, Lunenburg; and J. G. Johnston, Ottawa; were appointed a Nominating Committee.

After some discussion it was unanimously resolved, on motion by Mr. Powers, that the convention next year should be held in Halifax.

It was resolved to organize Provincial Associations on the basis of a constitution recommended by the special committee appointed to consider this question, such constitution being an alteration of that of the National Association in such a manner as to make it applicable to the provincial organizations.

After discussion it was resolved to leave with the Executive Committee the question of the advisability of appointing a permanent secretary.

The report of the Treasurer, Alderman Lamarche, was presented, showing receipts $303.21; expenditures $226.61; balance in hand, including previous balances, $293.22. The Auditing Committee reported the Treasurer's books correct, and a vote of thanks was tendered to that official.

A vote of thanks was also tendered to the Local Association and to the City Council, to the retiring President, Mr. Meredith, and to the retiring Secretary, Mr. Mansell.

The election of officers resulted as follows:—Past-President, W. H. Meredith, Toronto; President, John McKinley, Ottawa; Vice-President, Frank Powers, Lunenburg, N.S.; Secretary, H. A. Knox, Ottawa; Treasurer, Ald. Lamarche, Montreal; Vice-President for Ontario, W. Mansell, Toronto; Vice-President for Quebec, John Watson; Vice-President for Nova Scotia, G. A. Perrier, Halifax; Vice-President for New Brunswick, James Walker, St. John; Vice-President for British Columbia, J. H. Wilson, Toronto; Vice-President for Manitoba, Capt. J. A. Giroux, Montreal; Chairmen of Committees—Apprenticeship, R. Ross, Toronto; Legislative, E. B. Butterworth, Ottawa; Sanitary, J. W. Hughes, Montreal; Essay, George Morton, Yarmouth, N.S.; Sub-Executive—President McKinley, Ald. Lamarche, H. A. Knox, John Watson, F. G. Johnston.

After the close of the last business session a visit was paid to Government House, where a group photograph was taken, after which the members and visitors proceeded by electric car to Long Branch and gave themselves up to an afternoon of enjoyment.

Branch Office of the CANADIAN ARCHITECT AND BUILDER, Imperial Building.

MONTREAL, July 13th, 1901.

ARCHITECTURE AT THE UNIVERSITY.

A course in Architecture has now become quite common in the calendar of universities so that any discussion on the benefits to be derived therefrom should be of interest to architects. There are at the present time some nine or ten universities in the United States giving such a course so that there should be sufficient evidence to show the pros. and cons. of the architectural school. The work done at such universities as Columbia, Cornell and Pennsylvania to say nothing of the now almost universally known Massachusetts Institute of Technology, is beyond the experimental stage and has been of undoubted benefit to the standard of Architecture in the United States. Comparatively speaking, however, the work in these colleges is only in its infancy compared with what undoubtedly it should and will be. Architecture to be at its highest must be a live art, must have vitality of its own time and country. The architectural student is first taught correct proportion, and for this purpose is thoroughly grounded in the work of the Greeks, but it should be instilled into the student at the same time that it is not in copying the ornament and details of the best periods of Architecture that anything really great can be produced, but on having gained the power of perceiving the right and proper proportions, to be able to design and use ornament, etc., of local interest. Where are there such opportunities for such work as in the architectural college? Ornament should be taught from the best examples, then the rules governing them applied to the design of local flowers, plants and trees.

The Egyptian and the Greek carried the design of the palm and the acanthus to perfection, plants growing at that time and in that country. Let students be taught the principles that underlie all that is considered, after centuries, great in Architecture, and see the reasons, the why and the wherefore of its greatness, and apply these principles to their own work, but using the materials and ornament expressive of their own time and locality. Let it also be instilled into them that what may be suitable in one district may be very bad Architecture in another, and that a universal Architecture would be of necessity bad Architecture.

It is commonly conceded that a painter or sculptor must not slavishly copy the works of the great masters, but must take from nature and express it on canvass or in marble. The architect, on the other hand, is mostly satisfied to copy, more or less, his detail, using ornament expressive of another country and of a bygone age. As long as this lasts there can and will be no real live Architecture, and it will be to the architectural college that we will probably have to look for the first signs of improvement.

It is necessary, in order to make the course a success, that it be brought up to the highest standard, as unless a course is up to a certain standard students will not attend, and it soon becomes a financial as well as a teachers' failure. For instance, at McGill University, where there has been an architectural course since 1896, the staff of teachers has been limited, and although this course is allied to Applied Science, the number of teachers is small to bring the work to the standard suggested. The successful colleges in the United States usually have a staff somewhat as follows:—

1. Professor in charge of the department.
2. Assistant Professor, Design and Ornament.
3. Instructor in Freehand, Geometry and Perspective.
4. Instructor in Water Color and Pen and Ink Work.
5. Instructor in Materials and Structural Design.
6. Instructor in Modelling.
7. Instructor in Landscape Architecture.

Besides studies gained from teachers in other departments on Elementary Chemistry, Geology, Botany, Mathematics and laws relating to Building. It is almost impossible with a staff of two or three to bring the course up to the highest pitch with all the various subjects necessary in Architecture. In Medicine the various practising doctors give lectures and hold clinics, and if the same thing was in vogue to the same extent in Architecture we feel sure there would be a vast improvement. It is the day of specialists, and it is necessary that a staff of specialists be employed as teachers in any course in order that it be successful. The various colleges have a great daty to perform in raising the standard of Architecture, and we trust to see McGill do its share for Canada.

THE CITY BEAUTIFUL.

"The perfect opportunity of the architect will not come until men dream of, and work earnestly and rationally for cities beautiful." The above quotation is applicable at the present time in Montreal when there is so much talk of:—

1. Harbor improvements.
2. Raising the tracks of the Grand Trunk Railway.
3. Underground wires in connection with the new electric light contract.

In respect to the raising of tracks of the Grand Trunk, which will be an enormous expense to the company and at the same time an eyesore to the community, we would like to suggest as an alternative scheme that the rails should be run from Victoria Bridge around the space at the head of the Guard Pier along the lower side of Mill street across the canal at or near Black's bridge and the back of the buildings facing Common street to McGill street. The tracks from the canal to McGill street to be elevated. By this scheme the railway company would save the level crossings, save the best part of the expense, if not all, of changing their present tracks, as the sales of their property on which their tracks are now would probably more than pay for their extra work, and have their station near their new offices, and save several minutes on the traffic over the bridge. The community on their side would save the spoiling of their property on each side of the railway which runs through the heart of the city and the station would be equally if not more handy.

We would commend this to the thoughts of the City Council and the railway company.

In respect to the placing of the wires underground as a necessary part of the contract for lighting the city to whichever company gets it, we would like to urge the necessity of it as a safeguard for the public and also from the point of disfigurement of the city as a whole, for the best as well as the poorest districts are overrun with these wires to the detriment of all good Architecture. It is the duty of the City Council to see that this clause is inserted in the contract, and it is also the duty of the citizens to see that the Council fulfils its duty or to know the reason why next February.

"If members of architectural societies would meet for the discussion of the aesthetic possibilities of their own communities, they would do much to substitute in themselves a broad for a narrow view and popularly to educate to appreciation of, and wish for, cities beautiful. To do this is the architects' duty, and upon success in it rests his hope." We commend the above quotation to the

thoughts of the Councils of the various architectural societies or clubs in Canada. It is time that the art interests of the country be considered, and the architect has his duty to perform to his city as well as to his clients.

P. Q. A. A. NOTES.

The P.Q.A.A. has issued a catalogue of the books in the library of the Association which will be found very useful to members wishing to refer for information to the library. We regret to say that the library has not been used to the extent that it should be, considering the value of many of the books. We would, however, like to suggest the necessity of adding to the collection from time to time, as the 200 volumes should only be the beginning of the collection. We would further like to suggest that such standard magazines as the "Builder," of London, and the "Brickbuilder," of Boston, be added to the list of magazines on the table. We trust that by so enhancing the usefulness of the library the members and students will show their appreciation thereof by making use of the books, and thus encourage the Association to add to the list of both magazines and books.

THE NEW PLUMBING BY-LAW.

The new plumbing by-law of the City of Montreal was passed by the City Council on June 12th last, and will come into force on the 1st of September. A copy of this by-law is printed in the present number of the Canadian Architect and Builder, and it would be well for architects, plumbers and others interested to make careful study of its provisions. One of the chief changes appears to be that "Any person engaged in or working at the business of plumbing prior to the passing of this by-law, and desiring to engage in or work at said business, either as a master or employing plumber in the City of Montreal, shall on or before the 1st of September, 1901, apply to the board of examiners hereinafter provided for, to be examined as to his qualifications for such business."

BRITISH COLUMBIA LETTERS.

No. VI.

In a brand new country, such as is this Western Province, Viator finds many little idiosyncracies to amuse, surprise, or perchance, to puzzle him; one of the most strongly marked of these is a curious objection to any criticism that is not merely flattery. It would appear that, in the juvenile stages, communities like persons are impatient of anything that may be construed into correction. The Parochial Patriot swells visibly with satisfaction when we express admiration of the physical beauty and natural advantages surrounding the youthful community of which the P. P. is a unit, and seldom does he fail to remind the speaker that "we are so young, you know!" as though to imply that our admiration might be augmented somewhat on that account. If, on the other hand, it is pointed out that the newest and best of methods might be reasonably expected to prevail in the newest and best of towns, whereas the very reverse appears to very frequently be the case, our friend the Patriot promptly advances (with a somewhat injured air) the same old well-worn apology for all shortcomings, "We are so young, you know!"—which certainly savours of the blowing that is both hot and cold.

The Press is largely responsible for this beam in the public eye—for this singular local vision which regards its own failures through the wrong end of the telescope and its successes through "a pair of double million magnifiers," as Sam Weller would have said—for the Press publishes the most reckless statements respecting trade or the prospect of the building season, the output of the Yukon, or the probable growth of "our" population; the reports regarding the superior magnitude and beauty of our buildings are often simply astounding, and the notice (probably well paid for) of a few works of art causes almost as great a strain upon the supply of adjectives as does the so-called report of an opposition political meeting.

Quite recently a paragraph appeared in a local newspaper stating that some exceptionally fine pictures, the work of leading European masters, were for sale in such and such a place on Hastings street. Though we should have known better by this time, we went to the place indicated, only to discover these "works by leading European masters" to be the most ordinary of catch-penny productions in very gilt frames, evidently prepared for sale in job lots by painters who were certainly in no sense masters. This being but too obvious, why should so misleading a description be published? If intended in the nature of a critique it was preposterous; if it was a mere advertisement, then it should have appeared in such a manner it could not have been mistaken for anything else. This sort of thing occurs frequently and may be intended for news, but is nevertheless objectionable to those who prefer facts to fiction.

About the same time appeared a so-called description of a nearly completed church, a description which could not have been pitched in a higher key had the theme been Chartres, St. Ouen, York Minster, Canterbury or Cologne. A little later the same journal gave vent to an agony in several columns dedicated to, we believe, The Stately Homes of Vancouver. The writer simply lost his way in the most astounding maze of terms from which he was evidently unable to extricate himself; the meaning of it all, if there was any meaning—and we cannot state positively that there was—seemed to be, that Vancouver as a whole was housed like the merchant princes of Venice, with a touch of the best of England's most famous country house architecture. A somewhat extraordinary effusion, indeed, which read rather like an architectural Book of Revelations.

What good can come of all this nonsense? Why should such gloria reporter rhetoric be so revelled in whenever the theme be the completion of a two or three-storey block of prosaic shops and offices, the auction of a few tenth-rate paintings (in very gilt frames), or the opening, say, of a church, over the whole of which is written in big bold letters an avowed expediency and cheapness? In how much better taste would it be to say that the shops were large and well lighted, the offices convenient—that paintings by Messrs. So and So, representing certain scenes in Italy, the Tyrol and so forth, might be seen by those interested in such matters at such a place—instead of describing the church in the most grandiloquent language with a reckless misapplication of architectural terms calculated to drive a glossographer crazy. Instead of all this riot of words bereft of meaning, why not simply state that the plan is a Latin cross, the apse circular; to give the general dimensions of the nave, aisles, choir, transept, etc., together with a description of the various materials used, the cost of this and similar structures in the locality, to indicate in what direction the quality of our building may show advancement. Of course more of this would be criticism, but it would certainly be useful, because truthful, information, as opposed to ignorant and irresponsible laudation, which makes us inclined when referring to it to act upon Sir Toby Belch's instructions, "Let there be gall enough in thy ink, tho' thou write with a goose pen, no matter!"

Probably the Rhetorical Reporter thinks with W. Hanibal Chollop that "Our backs is easy riz, and we must be cracked up," and no doubt he knows his public—none the less it would be well if he came to realize that there are very many exceptions to the Chollop rule.

So general is the dislike to criticism that the then Executive of the Arts and Crafts Association caused it to be recorded on their minutes that they were of the opinion that no member of the Association should criticize the work of fellow members in the public press or magazines! Criticism being absolutely barred all notices of future exhibitions will at best become merely descriptive catalogues, though descriptive they can hardly be, for it is impossible to be said to describe a picture if all reference to its qualities be omitted. Thus it will be seen that we shall either have no notices worth having, or else the flowery flattery before referred to.

Painters may come and painters may go, but Art goes on for ever, and criticism will ever be found in close

attendance upon her. It has been said that taste is the faculty that enables us to distinguish the merits of a work apart from our own likes and dislikes. This faculty must, however, be carefully cultivated before it becomes taste, for knowledge is the foundation of correct taste. The first essential in a critic is therefore cultivated taste or knowledge, and the deeper his knowledge the less likely is he to be biased by predilection. A critic need not of necessity be a performer, for the perceptive faculty is not always accompanied by the creative. To better illustrate my meaning—"A" studies landscape painting in certain schools and adopts the methods peculiar to one of them, and in time becomes a distinguished painter, probably with a strong bias towards his favorite school, and it not unfrequently happens that he has little toleration for any other. "B," on the other hand, finding that a lack of technical and creative power prevents him from hoping for any measure of success as a worker, turns his attention to the several schools and, having at length absolute merits of landscapes painted in any school. The opinion of "B" is necessarily of greater value than that of "A," though his work might be in every sense inferior to that of the latter. The opinion is commonly held here that a critic who cannot with his own hands produce something better than the object he criticizes, is not qualified to express judgment. This wholly erroneous contention is so frequently encountered, we have dwelt upon it at some length. One may as well urge that the architect who cannot wipe a lead joint, dowel a stone or lay a few courses of brick work in Old English Bond, is incapable of judging the work of the different trades. It is well known that few performers can justly guage their own capacity, whereas a capable critic knows exactly the extent and measure of his knowledge.

It seems to us that what we all most desperately require is a standard of criticism. Raise that standard and you raise the aim of artsmen and craftsmen. The public, too, is gradually taught by able criticism to discriminate between that which is fairly good and that which is downright bad, which would be a change indeed. To betray any impatience under fair criticism is to reveal an inability to be introspective, to be, in other words, childishly thin-skinned. Honest criticism, even if it is proved to be not altogether sound, can do no one harm and may do good, for it should cause the producer of the object criticized to carefully analyse the work in question if only to reassure himself that he is right. Of course we are assuming throughout that our critic is a critic, and not merely the ordinary ignoramus talking through his hat, as the vernacular elegantly expresses it.

Our object in touching upon this question of criticism is mainly to draw attention to the remarkable absence of it in this country, and the substitution of absurdly high and often unqualified praise, amounting to gross exaggeration on the one hand, or downright vehement abuse on the other—both being equally objectionable—also to the scarcely less remarkable absence of any fixed standard of excellence in most things, more particularly in relation to matters of taste. We do not intend to try in a paper of such necessarily narrow limits as to quantity, to assign reasons for the existing state of affairs; it is sufficient to note the evil and do something towards remedying it, and the initial step is to improve our own standard of excellence and reconcile ourselves to the cool surgeon-like knife of fearless criticism. How can we learn if we will not be taught, and why should the producer of a work of art so frequently resent even the inference that faults may be discovered in his work? One would suppose Art to be in no sense public property, and her votaries the only people on earth exempt from human weaknesses, whereas Art is very dependent indeed upon the said public, which is in its turn mainly, if not entirely, dependent upon published criticism for its education, when it has any. If anyone produces work for sale and for exhibition it is certain to be more or less closely analysed, and it will behove us to remember that in the great majority of cases the critics are right. No doubt at times eccentricity is mistaken for genius, and vice versa. There is such a flagrant instance of fallibility as the passing over of such a man as J. W. M. Turner, whose extraordinary gifts were long unrecognized, and no doubt respectable mediocrity occasionally turns down much greater ability. Which all goes to prove that knowledge is the foundation of taste, and that when a man like Turner does appear in this unregenerate world and works in an atmosphere we know not, and whose work speaks in a language that is strange to his generation, it merely means that the world has to be educated up to his higher standard before he can be understood. It is hard on the genius, but extremely good for the millions of fools.

Critics constantly disagree, but most usually on questions that time alone will correctly answer, but the criticism which concerns us is of a comparatively elementary kind; too frequently our critic's main difficulty is to find something good to say for us, the faults being all too easily found. When adversely criticized let us smother our wounded vanity and endeavor to remember that our work will not be made one whit better by our angrily declaiming that the miserable creature who says the arm of our Eros is out of drawing, knows nothing about the matter, or that Jones always was a hopeless ass, that he is a hopeless ass, and that he always will be a hopeless ass, because he referred, not unkindly, to the mustardy tones of our greenery-yellery landscape, or because he objected to the clever manner in which our impressionist picture avoids all the real difficulties of painting; or that the plan is bad and the composition commonplace of our competition design. Such expressions are not altogether as pleasant to hear as more flattering but less truthful ones might be, but if we are endowed with an ordinarily full measure of that uncommon thing called common sense, it is ten times more likely that we will find if we search that the fault lies with our work and not with those whom we have heard grandiloquently alluded to as "our traducers."

It must be borne in mind that only a very minute portion of the people ever devote a moment's thought to what constitutes good or bad taste, that a smaller proportion still are artsmen and craftsmen, and that few, very few, only of these really fully exercise their powers of observation and learn how to discriminate with some accuracy. Most Art is commonplace and when someone rises above his fellows and mediocrity, Envy endeavors to reduce the little eminence to a mole hill, while injudicious flattery tries to elevate it to the Himalayan heights of Heaven-born genius. Then comes the sober critic who gives us the true attitude, in inches. It is this matter-of-fact-surveying sort of process that some people find so hard to bear. The nihil me tangere attitude that is frequently adopted always reminds us of the inebriated Scotchman who having tumbled into an open grave overnight, was awakened in the early morning by the village band, which he mistook for the last trump, and emerging from his temporary retirement and finding himself quite alone, the only one of the elect in short, expressed it as his opinion that it was a puir puir show for Abergeldy. But think of the ultimate disillusionment which came to the unfortunate man. Does it ever come to those artists of the type referred to? It would do the vast majority of our artists no end of good to sit in a sort of Trial Eight, as it were, and to learn to stoically endure the pungent remarks passed on their efforts, the impassioned exortations and despairing tones of our honest, capable, hard-working coach. Unless prepared to learn we cannot improve; we cannot learn without submitting to criticism, and we often regard our mentor as hard and unsympathetic, when the truth is that his standard of excellence is higher than our own. With corrupt or incompetent judges, justice is but hardly served, so from incompetent critics little can be learned of the truth, and as we are on this earth primarily to gain knowledge through long-suffering and bitter experience, let us pray for fearless, cultivated criticism, and to be stiff enough not to whine when our vanity and self-esteem is made to suffer a little healthful sensation of smart and tingle.

HANGING PAPER ON CEILINGS.

When the face of plastered walls is not good enough to turn out a good job of distemper a fine new surface is attained by lining them with blank lining paper. In papering a ceiling with lining paper it is better says the Painters' Magazine, that the edges of the lengths should barely meet than that they should overlap. In cutting ceiling papers to the angles formed with the wall, the less they are allowed to lap on to the wall the better. Half an inch or so is quite sufficient; because when a couple of thicknesses of paper are on such places they generally "spring" unless they are very strongly attached.

If there are any cracks in the plaster they need even more attention than in cases where distemper is to be applied direct to the ceiling. In stopping a crack the object is not only to fill it up. With cracks in ceilings generally, one edge will be found to be slightly drooped below the other. In this case the crack requires to be cut out before stopping. If it were not, after lining it would show as a sharp, irregular edge. The only remedy is to enlarge the crack, more or less, according to its importance, by scraping or cutting it out with a stopping knife. For stopping large cracks a stopper—a knife with a blade about three inches wide—is a very serviceable tool. It might be worth while remarking here that where walls or ceilings are to be finished in distemper, without previous papering, it is best, in stopping, to discard steel knives, which scrape and disfigure the face of the plaster in a way which invariably shows through the subsequent mat of distemper. Use instead a tool made of wood and shaped like a stripper, and use it in the same way. As to the stopping, it is generally made of plaster of paris with whiting added. Sometimes, when convenience renders it necessary, some add a few drops of size to the mixture to prevent its too rapid setting. It is surprising to one not familiar with it what an effect the addition of size has; but, at the same time, it is generally considered that the stopping is better without this addition. Always wet cracks, etc., thoroughly before putting in the plaster, otherwise it will not adhere for any length of time.

But to return to the paper hanging. In lining a ceiling start the paper from the wall nearest the window and work towards the door. The reason of this is that if there should be any overlapping edges they will be facing the window and therefore not visible from the door or main part of the room—that is in a room of ordinary shape. If, on the other hand, the paper were hung to the window, overlapping edges, which, even with the most careful workmen are bound to occur, throw a shadow line, which, under usual conditions, would be almost certain to catch the eye.

In papering a ceiling proceed in the same way as for walls. Find the length of the pieces of paper to go from wall to wall, and cut the number required. Arrange a scaffold so as to have the plank running close up to, and parallel with the wall to which the first length is to be hung. Ceiling lengths are generally longer than a wall requires. Fold them with a long fold at the top—or starting end—and a very short fold at the bottom or finishing end.

The first length has no previous one to match to. We shall, therefore, for convenience sake, consider it hung, and will describe the manner of getting the second up, which description will apply equally well to all those that follow. And, first, as to pasting. In this, as a rule, there is not much variation necessary, except when the lengths are very long. Say men are on a moderately sized room. Make the first fold as large as the board will allow, and the bottom end one much smaller. The next operation is to hang it. In hanging ceilings a roll or portion of a roll of paper is necessary as a support to the pasted lengths. Insert this roll beneath the top portion of the pasted length on the board and lift and carry it on the roll to the scaffold. Have the plank running parallel with the length previously hung, and have the inside edge of it directly under, and in a line with the outer edge of the last length hung. This is important in order to be directly under one's work. Do not have the scaffold too high, but sufficiently low to allow the body, arms and eyes full play. Start from the right hand wall with your back to the last length on the ceiling. With the right hand take hold of the extreme corner of the length by the inside edge. Now open the first fold and move the supporting roll about until we have two or three feet between the two hands. If we succeed in placing these two or three feet on the ceiling correctly the remainder of the length, however long, if the ceiling be true, will find its place almost as a matter of course.

Hold the length up to the ceiling, with arms outstretched, and work it about, within an inch or so of the ceiling until we have settled the correct place in which it is to go—but do not, on any account, allow it to touch yet—and, when this is settled, with the right hand match and place the near end corner. Now we have to see to the portion directly over the supporting roll held by the left hand. Though the right hand should not be allowed to shift yet, it must be used as a pivot for the portion over the left hand to be correctly worked into place. When the edges of the space between the two hands match correctly, temporarily press the roll on the ceiling, run the right hand along the edge, to fix the match, and then, still holding the roll in the left hand, firmly against the ceiling, take the brush from the pocket and brush down the first foot or two of paper. If the length be correctly started in this fashion, all we have to do is to move the supporting roll along under the paper, a foot or more at a time, and brush down by a brush stroke on the middle of the length, followed by others towards the edges, keeping the roll in the left hand always an inch or two away from the ceiling.

If the first foot or so of edge is perfectly parallel with the edge of the previous length, the whole length will brush into its place without the least trouble. But if the edge over the left hand is the least bit overlapped, whilst correct at the extreme starting point, it will mean that the overlap will gradually increase as the length is brushed on, until, at the finishing end, it may be a half inch or more overlapped, and the whole match consequently bad. If, on the other hand, it overlaps slightly at the extreme starting-point, and is just where the supporting roll is, it will be found that before many more feet of the paper is brushed on the edges of the length previously hung and of that being hung will appear to be growing gradually wider apart, leaving a considerable space of the ceiling bare and necessitating either that the length be taken off and rematched or else subjected to a considerable amount of brushing and twisting, which will have to be repeated in hanging subsequent lengths.

Never allow the pasted side of the paper to touch the ceiling until it is brushed into its place. Keep the roll supporting the pasted length always a few inches away from the ceiling. When we come to the small end fold, however, the roll may be temporarily placed firmly against the ceiling whilst the fold is being undone.

Papering a large ceiling is really little more difficult than doing a small one, the only extra trouble being in handling the large body of pasted paper. But the secret of success is to correctly match the first foot or two. The method of folding the pasted lengths needs to be varied somewhat. The method generally adopted by the best paperhangers I have known is rather difficult to describe, but is as follows: Paste and fold the first part resting on the board, but partly unfold it back until the extreme end rests on the turning point of the large fold. The first long fold is, in fact, half unfolded again. This gives us two short folds with a portion of the pasted side upward. Draw the length along and paste, fold, and again half unfold this second portion. These short half-folds may be continued as long as necessary, the final fold being an ordinary short fold in the opposite direction. Now, to hang the length, place the supporting roll directly under these numerous half-folds. The left hand, with the roll, supports the pasted folds, which must not be allowed to touch the ceiling, whilst the right hand is at liberty to fix the matching edge in its place and then brush the paper down, the short folds on the supporting roll gradually unrolling of themselves as the operator moves along the plank.

NON-INFLAMMABLE WOOD.

The degree of excellence to which the fireproofing of modern buildings has been carried, is evidenced by the severe tests which have recently been made in the United States and other countries with wood treated by the electric process of fireproofing. This process is the latest development in the science of rendering wood non-inflammable, and has been adopted by the British and United States naval authorities after a series of the most exhaustive comparative tests with every known method of fireproof construction in the line of material that could be utilized as wood in the building of warships. It has been endorsed by leading architects and chemists in this and other countries and has been used in some of the most modern buildings recently constructed.

When the lumber is received at the fireproofing works it is piled in conical shape on iron cars with 3-8 lath between each layer of boards. After the load has been made up 105 ft. long, it is drawn into a cylinder by a one inch cable, after which the door is closed and locked. Then a steaming process takes place inside the cylinder, thus opening the pores of the wood. The sap is extracted from the wood and drawn from the cylinder by vacuum. While this is taking place inside the cylinder the chemicals in the large tanks overhead are going through a heat ng process. After the lumber has been softened to a certain degree and the pores thoroughly opened, the heated chemical is allowed to pass by gravity into the cylinder until it is filled, after which the pressure pumps are set to work and are kept working until the pressure has gained 150 pounds to the square inch. The chemicals in the cylinder are then forced back into the overhead tanks by means of air pumps, the doors are opened and the lumber drawn out of the cylinder and transferred to dry kilns, where the process is completed.

This electric process of fireproofing is at present carried on by three companies in the United States, one in London, Eng., and the Electric Fireproofing Company, of Canada, Limited, with office and works at Cote St. Paul, Montreal. A representative of the Canadian Architect and Builder recently visited the works of this company, which are situated at Cote St. Paul, on the Lachine Canal. The Grand Trunk Railway Company have siding into the premises, so that every facility for shipping by water or rail is available. The property covers an area of 7 1-2 acres, and the factory is built of solid brick with roof supported on steel columns and girders. The building is divided up into a cylinder-room, engine and pumping room, boiler room, coal room, chemical-room, storeroom, office, two dry kilns and transfer table. The building is so laid out that double the plant can be added as the business increases. The cylinder-room is 123 feet long by 32 feet wide, and contains two cylinders 105 feet long by 7 feet in diameter, capable of holding 15,000 feet B. M. of lumber each at one charge. Above the cylinders are three large feed tanks, each having a capacity of 26,330 gallons. The tanks contain the fireproofing solution, which is pumped into the cylinders under pressure. The doors of the cylinders are fastened by radial steel bolts weighing about ten tons, and are operated by two men in a few seconds; these doors have to stand at times an internal pressure of from 200 to 300 pounds per square inch. The boiler-room is 37 feet by 24 feet and contains two Babcock & Wilcox high pressure 75 horsepower boilers. These boilers supply steam to the cylinders, pumps, dry kilns, etc.

The engine-room is 39 feet by 37 feet, and contains a 75 horsepower Corliss engine; steam winch, 40 horsepower, for operating yard and lifting 8,000 pounds; one vacuum and pressure pump, 16 x 20 x 24 in.; duplex water pump, 8 x 7 x 12 in., connected to canal by an 8 inch water main; two duplex pressure pumps, 5 1-2 x 3 1-2 x 5 in., high pressure to cylinder; one pump for suction service to feed tanks, 5 1-2 x 3 1-2 x 5 ft.

The chemical mixing room is 37 feet by 34 feet, and a storeroom above of the same size. In this room is placed two setting tanks 12 x 8 x 6 in.; directly above is one circular tank, 5 feet diameter by 3 feet 6 inches deep, used for mixing the chemicals; two dry kilns two-storey high, 123 feet by 16 feet 6 inches wide, each heated by the "Common-Sense" system of radiation. The lower storey is filled with the lumber, placed on cars, and is fed by a fan 110 inches in diameter, connected to a condenser, 21 x 5 ft. 2 in. x 4 ft. 6 in. high; this condenser is filled with cold water radiators, which purify the air as t passes through same into heater 12 ft. 3 in. x 5 ft., 2 x 7 ft. 2 in. high; this heater contains 8,000 feet of 1 inch steam pipe, which heats the air to a given temperature, after which it is blown into the dry kiln at the extreme end and sucked out at the rear end by means of the fan, which makes a continuous circulation of air. Above the dry kilns is a room for storage of lumber, 125 feet by 33 feet. The office is 32 feet by 48 feet, and includes a test-room, in which the chemicals and solutions are tested for strength and impurities. A traverse table 35 feet wide by 10 feet traverses 137 feet and is worked by a steam winch. It is used for transferring the cars of lumber from the yard to the cylinder and from there to the dry kilns, this giving access to all tracks in the yard. The railway track from the Grand Trunk Railway enters the grounds about midway and passes through the centre of the building, connecting with the various rooms, so that the least amount of handling of lumber is avoided, ensuring economy and the smallest amount of damage to the material.

Mr. Percival W. St. George, Men. Inst., C.E., is at the head of the Electric Fireproofing Company, of Canada, Limited, and under his able management the electric process will no doubt soon receive in Canada the same degree of recognition that it has already received in the United States and England.

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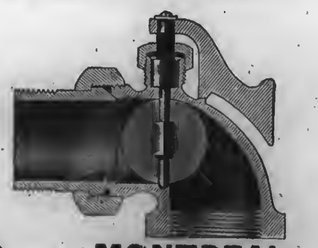

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RELATING TO PRESSURE OF AIR AND WATER.

It appears that the relations of pressure to distance in the forcing of water do not apply in the case of air, especially for long distances, although for short distances they may be taken as similar. Thus, if a certain head pressure be required to maintain an air current of a given volume and force through 1,000 feet, twice the head would not be sufficient for 2,000 feet. This is because of the increase in volume due to reduction in pressure, or loss of head, by the time the end of the first 1,000 feet has been reached. Consequently a greater pressure must be used to counteract this increased volume, in addition to the extra head required to maintain the force of the current beyond. The bulk of the pressure, however, is lost by leakage and by the bands and elbows of the tube, especially when the latter have too small a radius, the resistance or retarding effect increasing in some at present unknown proportion as the radius of the curve diminishes. In one case the loss of pressure, including leakage, was only two pounds of the initial 60 pounds required to transmit 875 cubic feet of air per minute through an eight inch pipe, 150 feet long. In another case, the driving of the Jeddo tunnel, at Ebervale, Pa., the loss was only 0.002 pound in transmitting air through a six inch tube a maximum distance of 10,800 feet, to drive two 3 1-4 inch drills. The volume of air required, however, for this purpose, 230 cubic feet per minute, was in small proportion to the size of the tube used. By careful consideration the transmission losses may be reduced to a minimum.—(R. Peel, Mine and Minerals, Pennsylvania, Vol. XX.)

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MACHINE-CUT vs. HAND-CUT STONE.

In the United States much controversy is now taking place as to the respective merits of machine-cut as against hand-cut stone. The advocates of hand-cutting declare that machine-cut stone when used for building purposes will not weather well. The surface is said to be shaken and stunned by the pressure of the heavy planing machine used. The very life and nature itself, it is said, is taken out of the stone by the planer. Small fillets are ground so that the fingers are almost able to press the edges off, and beads and other undercut members are stunned the whole length of the stone. It is urged also that there is yet another evil connected with the use of machinery for stone cutting, and that is the degeneration of the practical workman. If the use of machinery is further extended, it is urged that the new generation of artisans in the art of stone-cutting will know very little of the fundamental principles of their trade. All they will know is how to set in a mould for the planer, and how to joint the stone when finished. The advocates of machinery, on the other hand, declare that the use of machinery, if only by lessening the cost of production, has made the employment of stone possible where otherwise brick and cement, or some other substitute, would have been used. A planing machine will, it is contended, cut finer mouldings in true lines, either straight or circular, and leave the stone in a much better state to stand the effects of time than is possible by hand labor. Instances are cited in which stone of a kind easily split into thin slabs "bed way" has been so strained during hand labor as to be practically unsaleable; the same stone when machine-cut turning out excellent work. Be this as it may, it is certain that the use of machinery for stone cutting is largely on the increase in the United States, and is gradually spreading to this country. The cost of labor is the most important factor in the matter. It is the economic pressure thus brought along which will effect a revolution in older methods of doing work.

THE TORONTO INDUSTRIAL EXHIBITION.

The refusal of the property owners of Toronto to vote the money required for the erection of new Exhibition buildings, is a clear proof of their dissatisfaction with the management. That new buildings are necessary, few will deny, but new buildings alone are not sufficient to ensure the future development and success of the Exhibition. The management must also be improved. The Board of Directors should be re-organized, and the representation of the various interests made to properly correspond to their magnitude. As now constituted the larger representation is given to the bodies whose interest in and value to the Exhibition are the least. The Board is unwieldy and might with advantage be reduced in size. Some change seems also to be required in the personnel and methods of the immediate management if the Exhibition is to develop along broad lines and be successful. It has apparently reached its limit, if indeed it has not begun to retrograde, under the direction of the present managers. It must either go forward and increase in importance, or meet a speedy death. Forward should be the motto, and to that end everything that would stand in the way of progress be removed and the management brought thoroughly up to date. That should be the first step. When that is accomplished public confidence will be restored and the money for new buildings and other improvements will be forthcoming.

FIRE ESCAPES.

The manufacturers of fire escapes are enjoying a harvest of prosperity in consequence of the amendments to the Factory Act passed at the last session of the Ontario Legislature compelling all factory buildings to be equipped with proper escapes. The inspector estimates that in Toronto alone there are 300 factories requiring to be so equipped.

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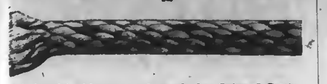

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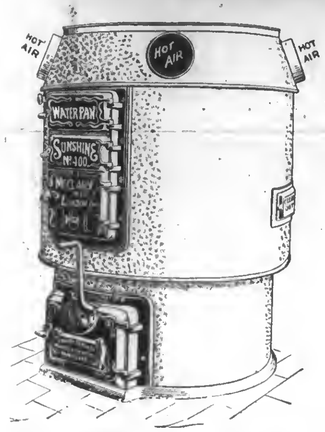

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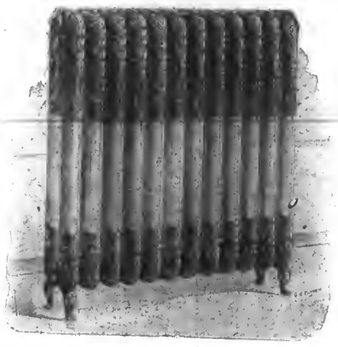

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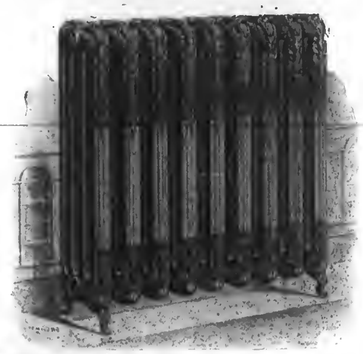

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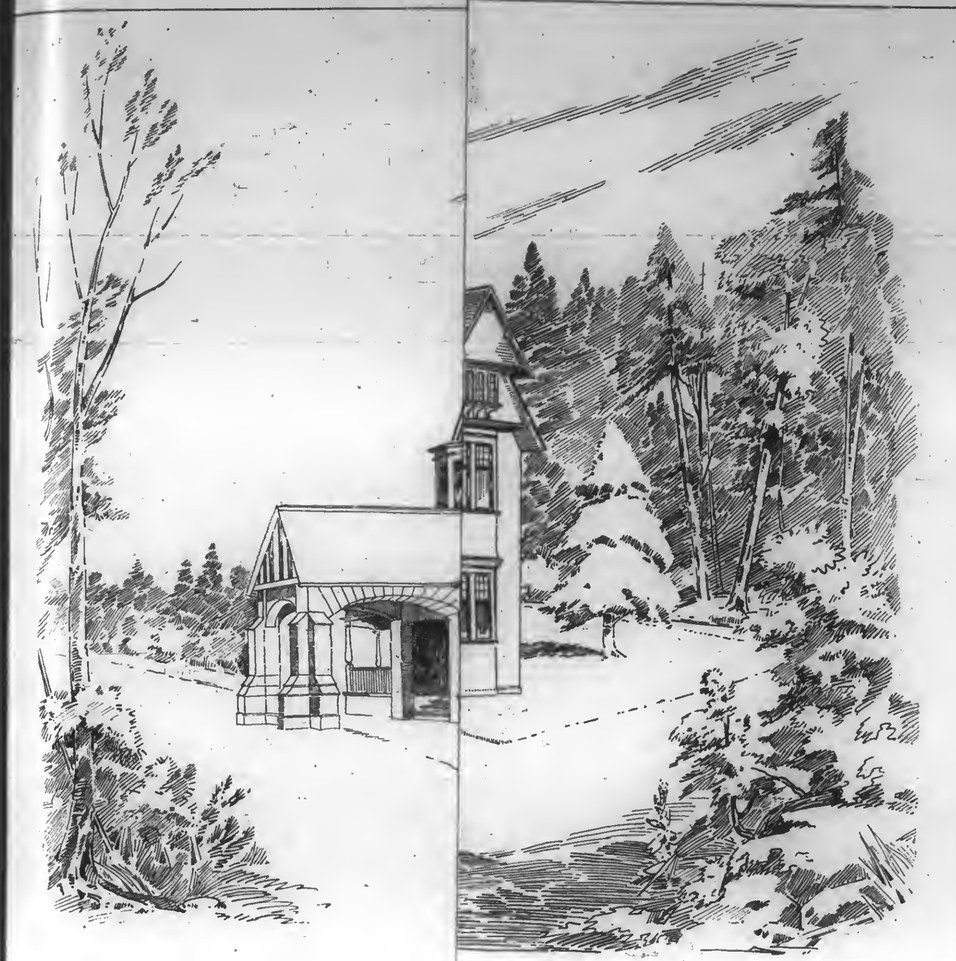

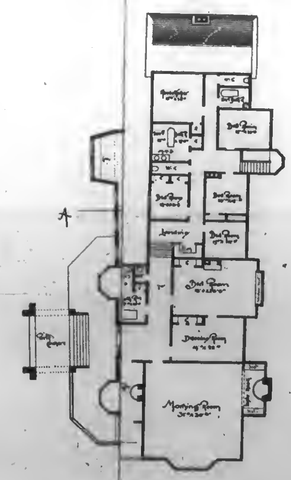

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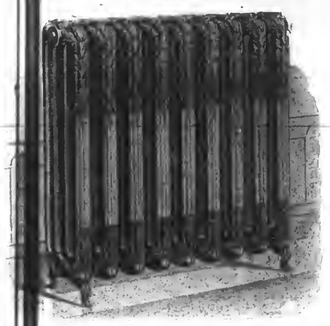

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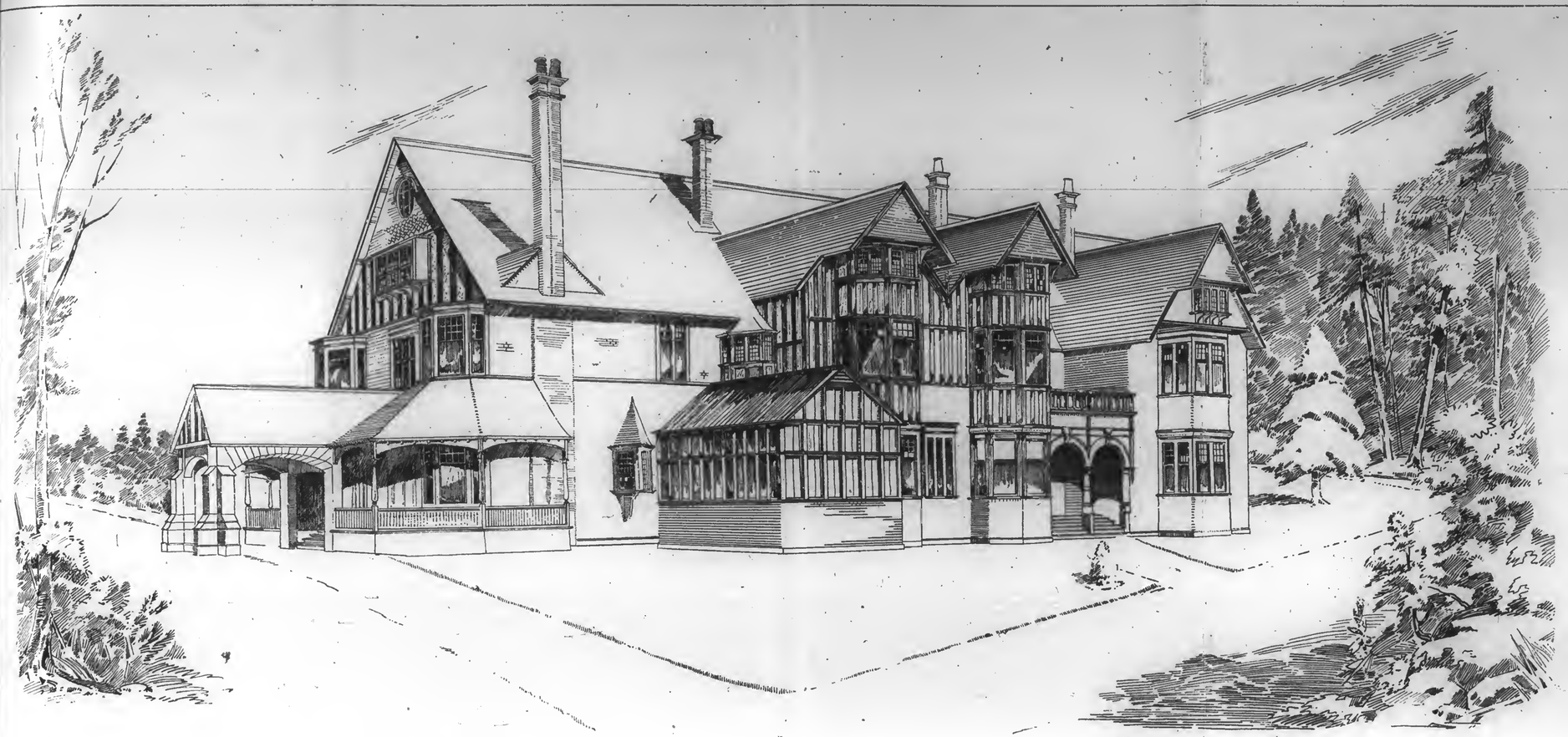

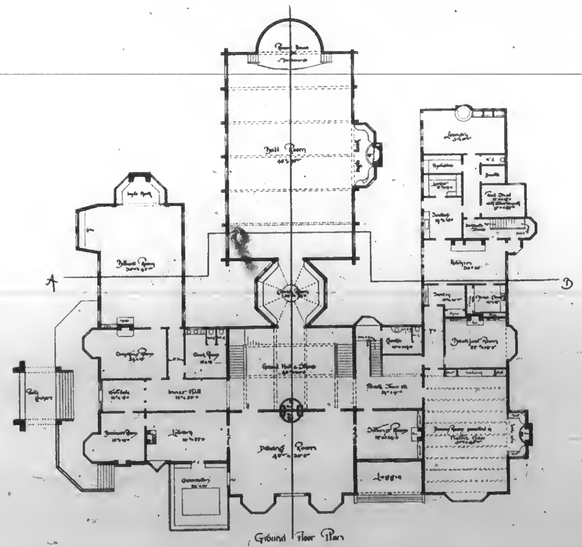

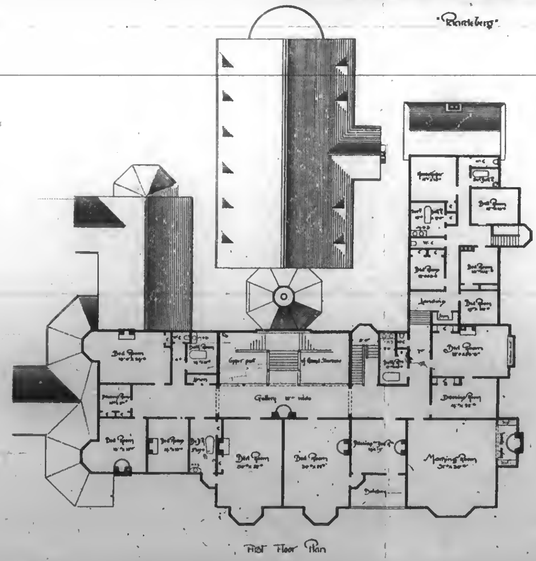

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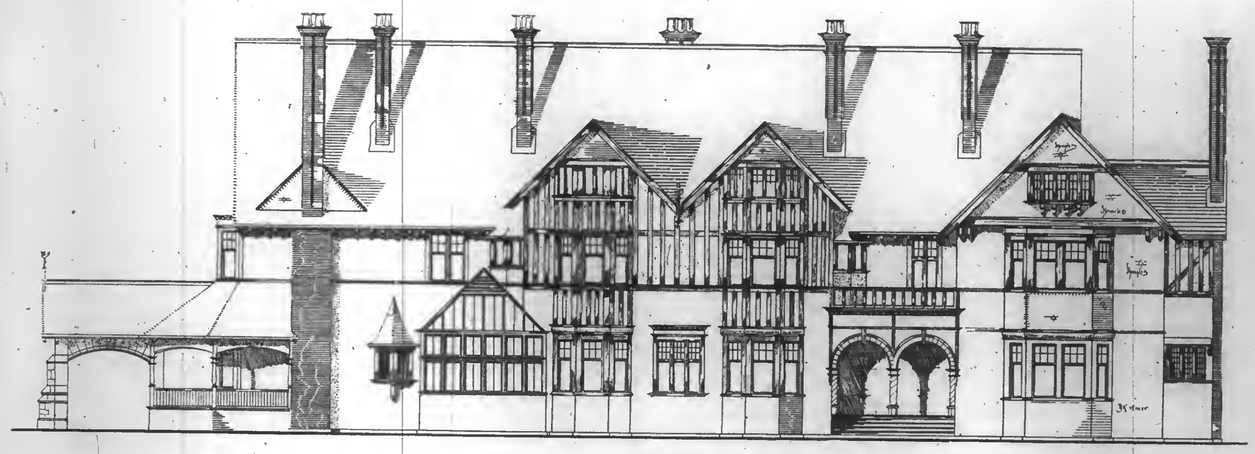

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The Canadian Architect and Builder

VOL. XIV.—No. 164. AUGUST, 1901.

ILLUSTRATIONS ON SHEETS.

House on Albany Avenue, Toronto—Chadwick & Beckett, Architects.

ILLUSTRATIONS IN TEXT.

Canadian Pavilion, Glasgow Exhibition.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Kirby Hall, England—Bay Windows and South-East Corner of Court Yard.
Preferred Designs in Competition for Manufacturers' Arch, Toronto—First position, Design by C. J. Gibson, Toronto; second position, Design by Henry Simpson, Toronto; third position, Design by W. P. Witton, Hamilton.

CONTENTS.

Editorial	145-46-47	Story of a University Building	152-53-54
By the Way	147	Licensing of Architects	154
Building Contracts	148-49-50	British Columbia Letter	155
The Manufacturers' Arch Competition	151	Students' Department	156
Awards to Canadian Architects	151	Danger of Putting Structures to New Uses	viii

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" W. H. ELLIOTT, of Messrs. Elliott & Son Co., Toronto.
" J. C. B. HORWOOD, Architect, Toronto.
" A. F. DUNLOP, R.C.A., Architect, Montreal.

The Site of the Victorian Statute.

THE Ontario government has rejected the proposal of the city council of Toronto that the proposed statue of her late Majesty, Queen Victoria, should be placed on the main approach to the Legislative Buildings, midway between the statue of the late Sir John Macdonald and the buildings. The government claim that this statue should occupy the foremost and most prominent position. This view will be generally admitted to be a reasonable and proper one. While it is perhaps an unusual thing to remove a prominent statue and place it in a less commanding situation, yet it would have appeared a graceful and reasonable act on the part of the city council to have consented to allow the statue of the greatest and best ruler the empire has ever had to supplant that of a colonial statesman, however great were his abilities and public services. Pity it is that the proposed Victoria Square opposite the new municipal buildings has not been secured by the city and is not ready to receive the Victoria statue.

Capital and Labor.

THE great combinations of capital and the aggressiveness of the unions of workmen in the United States, is bringing to a focus sooner than was expected the settlement of the relations that shall in future prevail between employer and employee. The most gigantic strike in history is now in progress between the steel workers and what is known as the United States Steel Trust. The employers are said to be losing a third of a million dollars per day, and the employees about half that sum. Upon the outcome of this great struggle will largely depend the conditions which are to govern, at least for a time, the relations of the combatants in the future. It seems impossible at present to forsee what the ultimate and permanent solution of the difficulty will be. It would seem, however, that there must either come a better understanding between employers and employees, by which regard will be shown for the interests of both, or the government must step in and compel the settlement of disputes by arbitration. In New South Wales, a compulsory arbitration law now prevails, and is said to be working satisfactorily. In Canada we have what are called Conciliation Laws, which provide means for the adjustment of disputes where both parties are willing to submit their case to arbitration. These laws appear to be a dead letter. The statement is made that in the present strike of trackmen on the C.P.R., which is a hindrance to public traffic, no request for arbitration has been made by either of the parties to the dispute. If the law is to be invoked, it must, to be of any service, be compulsory. It is most unfortunate that these disputes regarding wages and hours of labors should be allowed to block the wheels of industry in prosperous times, and hasten the return of commercial depression.

Decadence of the Exhibition.

In point of attendance the Pan-American Exhibition at Buffalo has thus far proved a failure. The holiday season, during which the largest attendance might reasonably be looked for, will soon have passed, yet the expected thousands have not put in an appearance, and in consequence it is rumored that the Exhibition may close at an earlier date than was intended. The fact is apparent that the Exhibition business has been overdone. The original idea of these large Exhibitions was to bring together the most improved devices and methods in manu-

facturing, as well as specimens of the natural products of the nations of the earth. So long as this was the prominent feature, and an interval of at least ten years was allowed between the Exhibitions, they were reasonably successful. In recent years, however, projects of this kind have become too numerous, while their educational value has seriously declined. The Exhibition of to-day is a huge bazaar and circus combined, depending for success not upon its ability to instruct, but to amuse and excite wonder. It is not surprising that agriculturists, inventors, manufacturers and artisans no longer think it worth the cost to exhibit, or the earnest worker in any department to travel long distances to visit modern shows. The city of St. Louis, where arrangements have been in progress for a year or more for an Exhibition on a large scale next year, has wisely taken warning by the failure at Buffalo, and postponed the event for at least three years. It is perfectly safe to assume that if with all its advantages of situtation, the Buffalo project has failed, St. Louis could not succeed in inducing northerners at least to exchange the cool breezes at the seaside, or by the great lakes, for her stifling atmosphere. She would do well to substitute for her proposed Exhibition a winter carnival. Canada's resources have only recently reached the point which would justify her in attempting to inaugurate a Dominion Exhibition. In view of the evident decline in public favor of such enterprises, the wisdom of embarking thereon now seems open to question.

Architectural Emotion.

Any student of literature can tell that the essentially modern phases of architecture, whether he likes them or not, are artificial, by merely reading what is written about them—if he can. The architecture generated by the arts and crafts movement in particular is given away at once by the young men who write about it. They are doctrinnaires and seek to persuade with words. Their style is uneasy. They feel the sense of the world to be obdurate, difficult to convince; and they wheedle and use adjectives. They contort their sentences so that the adjective comes first, and a superlative at that—"very pretty" is this, "very charming too" is that. They cannot let a plain statement stand by its own merits but seek to bolster it up with suggestion. It is not enough to say that a thing is of oak; they seek to commend it with the suggestion that it is "oak of sturdy British growth." It is not enough to suggest that a certain space will be convenient for pictures; we are offered the contemplation of "a few well chosen pictures." There is ultra refinement in this fewness. In the hammer marks on iron on the other hand we are asked to observe the interesting suggestion of sweat, which is not at all refined. When we come to the women's rooms, the inhabitants figure of course as "fair ladies," and the suggestion, made in one book, that we may imagine them talking about the Euphuists is remarkable. It would stick most fair ladies to say much about the Euphuists; but it is certainly suggestive that the authors of the book should have this sneaking regard for the most affected of England's many affectations. One is inclined to suspect that writers of this school would find themselves most at home talking art with the fair ladies. They are fond of certain words which come strangely from the mouth of a male man. "Cosy" is a favourite word, and "dainty" too we are sorry to say. It is to be feared that when these young men marry they will get wenches, though what the king needs is men. In America the theme is larger. It is not finish but creation they deal with, but the talk is not straight talk. Mr. Louis H. Sullivan's eloquence about the young man in architecture, to take a salient instance, is quite unnecessary. Abe Lincoln would have put the case in five minutes or less. Indeed there would be no need to invoke so great a mind. The work of talking about the "organic" and "functional" nature of true architecture and the "logic" of its expression is done; what we have to do now is to produce it, and if any talk will help us to that, it must be of the dry and scientific kind. There is too much emotion over architecture in the forward schools of the United States for one to believe that these producers have got down to a scientific basis. In the meantime Mr. Flagg, who represents the Frenchiness which represents classic taste in the United States, is cool and businesslike, and Mr. Reginald Blomfield, who in virtue of the new, handy edition of his Renaissance in England, may be taken to represent the classic school in England, is manly and dignified. One is convinced in reading the utterances of these gentlemen and others of the same class that, whether we like it or not, those who follow on in the old paths are practising a real profession of architecture.

L'Art Nouveau.

It is interesting to observe, as a corollary to the doctrine that "the old paths are the best," the divergence that is being made in France from the formalism that has hitherto been associated with French architecture. The newest minds are evidently tired of it, and are producing work which in feeling tends to the fantastic; though at present chiefly in detail. So far as that goes it is natural that freedom should begin with detail, as it is in the building up of design from fixed details that the formalism of the formal school arises. At present the new school of buildings ranges perfectly in general appearance with the prevailing Parisian type. It is only an inspection in detail that discovers the difference in feeling; but it gives an impression of wide difference, for the new detail is not only not formal but is formless. It has abandoned the Aristotelian basis of beginning, middle and end, and delights in forms that "grow" one from another, relying upon carving to get over difficulties of junction. This is nothing less, in its way, than a new French Revolution; a revulsion from one extreme to another. Unfortunately the opposite extreme from formalism is barbarism and L'Art Nouveau is nothing else; beautiful in refinement but unintellectual and promising nothing but reversion, because of disgust with itself. It seems to be the peculiarity of French logic that it can develop admirably, but cannot reform. The French idea of reform is reaction to the opposite extreme. It does not follow that the devotees of French architecture on this continent will follow the French in their reactionary vagaries, but it is decidedly worth while to observe these vagaries; and, before we accept the doctrine that French architecture is the only architecture, to note that there are some French architects who are tired of it.

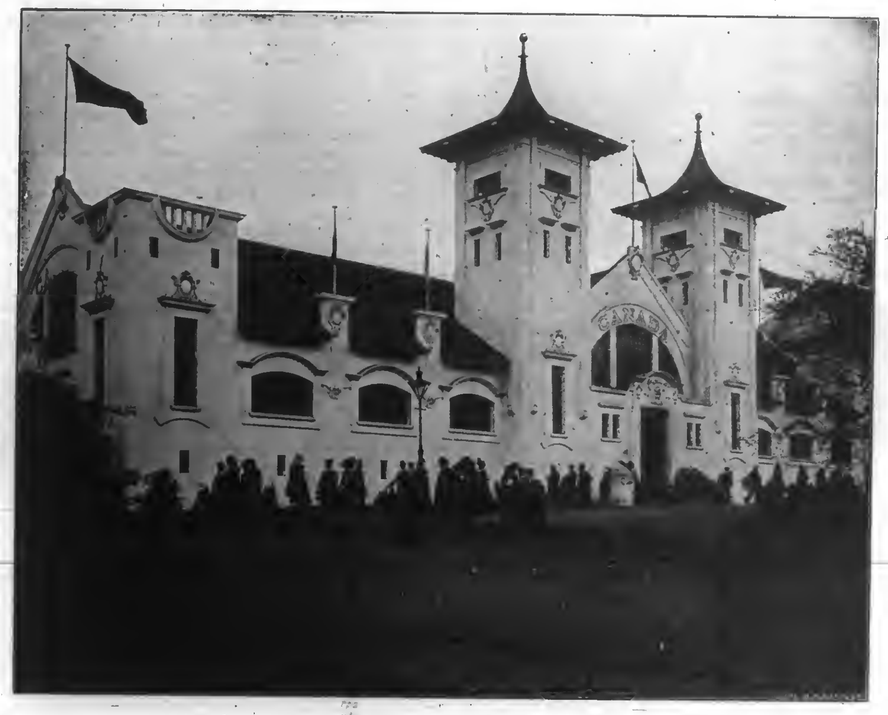
A large deposit of clay has been discovered near Little Current, Ont., which is pronounced by a German expert to be suitable for fire-clay and vitrified brick.

BY THE WAY.

For the first time since its erection twenty years ago, the spire of St. James Cathedral in Toronto is undergoing repairs and is being repainted. The work is being done by Messrs. A. B. Ormsby & Co., the steeplejacks being James Plumb and Frank Scully. The job is a hazardous one, the spire being upwards of 350 feet in height.

× × ×

It is not only Mark Twain's heathen Chinee whose ways are peculiar. In every community may be found people for whose peculiarities it is difficult to account. As a case in point, I may mention the circumstances connected with the buildings and plot of ground known as St. Patrick's Market, on Queen Street in the city of Toronto. This property was deeded to the city years ago for the purposes of a public market by one of the most wealthy and prominent citizens of that day.



Canadian Pavilion, Glasgow Exhibition.

For a number of years past two butchers have been the sole occupants of the building, which in reality has ceased to be a market, the business having been transferred to St. Andrews and St. Lawrence markets, situated respectively in the west and east ends of the city. Seeing that the property was no longer serving the purpose for which the donor intended it should be used, the city authorities proposed that it should be utilized as a public square, for which it is well adapted. Just here, however, the peculiarity of the administrators and assigns of the donor manifested itself. They declared that the property having been donated for a particular purpose, it must not be used for any other, and threatened that if it were so used, the rights of ownership would revert to the donor's estate.

× × ×

The interior of Osgoode Hall, Toronto, is being renovated and re-decorated in view of the approaching visit of the Duke of York.

× × ×

I learn from a contemporary that Miss Josephine W. Chapman, of Boston, a successful woman architect, will be the only representative of her sex at the Pan-American Exhibition, in Buffalo. Miss Chapman has erected a number of churches, business buildings, and residences. She employs none but men in her office, as she declares that women fail to give their undivided attention to the work, and at the most critical moment want to go home to make their clothes.

× × ×

A novel and expensive but not overwise method is said to have been chosen to determine the quality of the bricks produced by a large yard in the Western States. The proprietor and a brick mason contractor got into a discussion, and as the result a bet of $10,000 was made. The builder maintained that the brick would not sustain a column of 300 feet. He is to undertake the construction of a stack, and after it reaches a height that ordinary workmen refuse to continue on the structure, he will himself continue it up until something gives way. If it fall before it reaches 300 feet he wins: otherwise he loses. It is to be six and one-half bricks square at the base, with a square one-foot flue, up which the bricks are to be conveyed. The builder agrees to continue the stack until it falls, to be at the top when it gives way, and bets an additional $5000 that he will not be hurt in the collapse. The loser is to pay for the bricks.

BUILDING CONTRACTS.

The term building contract may be applied to any legally binding agreement which has for its subject matter or principal subject matter the erection of buildings or the execution of works of the nature of buildings, and, as generally used, it may be more particularly defined as an agreement by which one person or body of persons undertakes for a consideration to erect or construct for another buildings or other works of that nature.

The first necessity, in the case of such a contract, is of course that a site for the proposed buildings or works is to be provided, and as the usual occasion for a building contract is where the owner of a site desires to have it built upon, the term "building contract" is usually understood to import that the proposed buildings are to be erected upon the land of another for his use and benefit.

As the terms contract and agreement, as commonly used, have essentially the same legal significance of a legally binding agreement, that is to say an agreement enforceable by law, so there is not strictly speaking, any inherent or essential difference legally or grammatically between the terms building contract and building agreement, but in fact the former term has come to be used so as to import that the works to be done are to be done for the use and benefit of the owner of the land, whereas the term building agreement is usually confined to agreements providing for a grant to the builder of a lease of or other interest in the land upon completion of the building.

Although therefore either term may be applied to any agreement which provides for the erection of buildings, the term building contract naturally suggests to the experienced that the buildings are to be for the use and benefit of the building owner or employer, and consequently that the consideration is to be a money payment or something of the like nature, e.g., payment in shares of a company, whereas the term building agreement suggests that the builder is to acquire in consideration of his building a lease of or other interest in the land built upon. As illustrations, a simple instance of a building contract would be where—

> A., a builder, agrees with B., a landowner, to build him a house upon his land, in consideration of a lump sum to be paid on completion of the work.

And a similar instance of a building agreement would be where—

> A., a builder, agrees with B., a landowner, to build upon B.'s land in a specified manner, in consideration of B. granting to him a lease of the land and buildings.

The rent of such a lease is of course fixed at a sum considerably below the rack rent of the property as built upon, and the amount expended in buildings is in fact equivalent to a premium paid for having the property as built upon at a rent below the rack rent thereof. Although a contract to pull down a house comes within the Statute of Frauds as relating to an interest in land, and must be in writing, a contract to build a house does not.

In the case either of a building contract or building agreement, as above defined or distinguished, provisions will be found (1) on behalf of the landowner, (2) on behalf of the builder, and these are usually followed by provisions for the prevention or settlement of disputes which should be on behalf of both parties, but are in most cases found to be framed rather in the interest of the building owner or employer. The general object of the provisions on behalf of the building owner or employer is, putting it quite generally—

(a) That the buildings to be erected shall be of the desired nature and quality, and be completed within a specified time.

(b) That the builder shall not be entitled to his remuneration or consideration unless and until he has fulfilled his part of the bargain.

And the object of the provisions on behalf of the builder is—

> To put him into a position to claim his remuneration as soon as he has earned it under the stipulated terms.

Although these objects may be stated thus simply and shortly in a general way, the complicated nature of building operations and the many unforeseen occurrences which may intervene render numerous and elaborate precautions necessary for the prevention of disputes during the progress of, or after the completion, or (it may be) the previous abandonment of the works. The provisions embodying these precautions have now settled down into a number of well recognized clauses, the more important of which are to be found in any well-drawn building contract or agreement. These more important clauses it is proposed presently to consider in detail with special reference to the legal bearing and effect thereof and to certain judicial decisions thereon.

The subject of the present paper is building contracts in the ordinary sense as above distinguished, i.e., contracts for the erection of buildings or construction of works on the land of another person for the use and benefit of that other person. It is in the case of building contracts in this sense particularly, that the elaborate provisions to be presently considered are necessary in order to secure that the work shall be done in exact accordance with detailed requirements.

In the case of a building agreement, as an immediate lease or grant of the property is intended to be made to the builder, it is, as a rule, only necessary to provide that the buildings shall be sufficient to secure the intended rent and, perhaps, also to preserve the character of the neighborhood. For these purposes it is generally sufficient to provide that the buildings shall be of not less than a certain value and shall have a more or less uniform character. The builder himself having, or being about to acquire, an interest or estate in the property, may be relied upon to build so as to give the property a marketable value. Consequently it is not usually found necessary in building agreements to go into any great details as to the buildings to be erected.

When, however, buildings are to be for the use and benefit of the building owner, his first and foremost care will be that the agreement shall be framed so as to secure his getting what he wants in every detail, and to secure this is consequently the main object of the provisions of the contract on behalf of the employer.

Now if the buildings contemplated were nothing more than what Mr. Ruskin somewhere says is all that the ordinary British householder requires, viz., four brick walls and a drain pipe, the employer might possibly be able to decide for himself whether that desideratum were supplied, and the services of an architect or surveyor might be dispensed with. Pace Mr. Ruskin, however, and fortunately for the profession of architects, our needs and aspirations in the matter of building are seldom so simple, and, moreover, it is not only the demands of increasing wealth and luxury but the elaborate requirements of modern building acts which have to be met. Consequently building contracts are frequently required to provide for the proper execution of most extensive and costly works in accordance with most minute and detailed particulars. Hence the introduction into the contract or transaction of a third party in the person of the architect or surveyor of the building owner, whose duty it is to bring his expert knowledge to the assistance of the building owner as a guarantee that the work to be done shall be done in the way in which an expert knows it ought to be done.

One of the most important things to be considered is therefore the position of the architect or surveyor, both as regards the owner and the builder, and the nature of the authority, duties, rights and liabilities involved in that position.

Before proceeding to details, it is to be observed that, as in the case of all instruments where the salient provisions have settled down into recognized form this has been the result of a gradual growth, faults and deficiencies being rectified and supplied as experience has shown such rectification and supplement to be necessary. The case of conditions of sale will readily occur as an example of this growth or development. In preparing these, particular provisions to meet such particular case are required,

and are inserted by the draftsman as his skill and experience dictate, but beyond these special provisions there will be found a number of general forms which experience and the results of judicial decisions have shown to be necessary or expedient in every case, if disputes are to be avoided.

We come now to consider the general form which a building contract for the purposes and in the circumstances aforesaid has come to assume. In contracts for elaborate works, and especially in the kindred contracts usually known as engineering contracts, the instrument frequently commences with a series of definitions—

(a) of persons, e.g., building owner or employer, surveyor, engineer, clerk of works, etc.; and

(b) things, e.g., works, plant, drawings, schedule of prices, etc.

These, however, are rather matters of convenience and not of necessity, and need not be here considered.

For the reasons before indicated, viz., that the employer not usually being an expert, and so not being competent of himself to specify precisely what he requires, or to see that what is supplied is such, he will in the first place have employed an architect to prepare the plans and specifications for the proposed buildings, and the builder or contractor will be required to undertake to build them in accordance with such plans and specifications, and under the direction and to the satisfaction of the architect. The contract thus sets out by defining the work to be done, viz., that shown by the plans and specifications, and by providing a guarantee that it shall be properly done by requiring it to be done to the satisfaction of the building owner's architect or surveyor.

The question which naturally arises next is that as to the time for completion, and consequently the clause or clauses indicating the nature and extent of the work to be done is usually associated with or followed by provisions for securing completion within due time, and fixing the damages or penalties in default.

Next will naturally follow the question of the consideration or remuneration for the work with provisions as to the time, manner, and conditions of its payment. Then in order to prevent undue rigidity will follow provisions as to alterations and deviations.

It will then be found convenient to provide as far as possible for all matters or contingencies which, or the consequences of which might if left unprovided for, give rise to dispute or doubt, and of these the following may be here mentioned, namely:—Rectification of defects subsequently appearing, property in materials and plant, assignment and sub-letting of contract, bankruptcy of contractor, and lastly, there will be provisions for the prevention and settlement of disputes.

A convenient form of contract is—1st, To define or indicate the work to be done, the time for its completion and the nature and conditions of the consideration or remuneration, and then to schedule or otherwise annex the General Conditions of the Contract. These General Conditions are as above indicated frequently very numerous and exhaustive, and it is not within the scope of this paper to consider them in detail, but it is proposed to select a few of the more important which have been the subject of judicial decision, and to consider them with reference to those decisions.

Before proceeding to consider the first group of clauses, viz., those relating to the work to be done, the time for its completion, the payment or remuneration therefor, we may here consider the position of the architect—

(a) As regards the employer.

(b) As regards the builder.

(a) As regards the employer. The bargain between the architect and the employer for the preparation of the plans, etc., and his remuneration therefor, is of course a separate contract not concerning the builder, and as to this bargain three points only need be here considered—

(1) The remuneration.

(2) The ownership of the plans.

(3) Personal nature of the contract.

As to (1) it has been held in a case of Whipham v. Everitt, "Times," March 22nd, 1900, that though not legally binding on a building owner the charges of architects sanctioned by the R.I.B.A. are evidence of the reasonable nature of the architect's charges if in accordance with the schedule.

As to (2) If there is no special agreement as to ownership the employer is entitled to the plans when he has paid the architect his reasonable remuneration. See Ebby v. McGowan, "Times," Nov. 17th, 1870.

As to (3) The contract being personal, i.e., the personal skill of the particular architect being deemed to be relied on, the contract is dissolved by the architect's death. This is not so in the case of the builder, although it may be made so by express contract. Apart from stipulation to the contrary, if the builder dies, his representatives are bound to carry out his contract. Further, and this concerns the position of the architect as regards the builder also, he is the general agent of the employer for the purposes of the work he has to superintend (see Kimberley v. Vick. L. R. 13 Ev. 1), and as a result of this position of agency all dealings between the architect and the builders must be free from any suspicion of collusion, and if any collusion or secret dealing between the architect and the builder can be established, it will amount to a fraud on the employer, and entitle him to damages, or rescission of the contract. See Panama & South Pacific Telegraph Company v. India Rubber Telegraph Works Company. L. R. 10, Ch. 515.

Following the clause or clauses defining the work to be done as the main object of the contract, there usually follow a number of ancillary or subsidiary clauses indicating various preliminary and other matters and things to be attended to or done by the contractor, e.g.—

Giving of requisite notices.

Fencing.

Compliance with statutes.

Paying compensation for damage.

Indemnifying employer against risk.

The number and extent of these obligations of course largely depend on the nature and importance of the main works to be done, and the object is to throw upon the contractor the expense of all the preliminary and subsidiary matters which may be necessary to be done, or settled, in order that the main work may proceed to completion without any further expense to the employer than the stipulated cost. It is sometimes stipulated in the contract, that all materials be provided by the contractor at his own cost, but apart from such stipulation, a person who contracts to build a house impliedly undertakes to provide all necessary materials.

Resuming the question of the contents of the contract, we proceed to deal with the first group of clauses. The architect or surveyor is as we have seen the agent of the employer to see to the work on his behalf. In this capacity he is empowered—

(a) To inspect it, and, if necessary, to uncover and look into work for inspection.

(b) To require any inferior materials to be taken out and replaced by good, and any inferior or unskilful work to be redone or rectified.

If the architect's supervision is thorough and his powers to cause bad work to be made good are unflinchingly exercised, the probability is that a proper compliance with the contract on the part of the builder will thus be secured. But however careful the architect may be, defects of material or work may possibly be overlooked, and to meet this, the clause known as the Defects and Maintenance clause is inserted, providing for the rectification by the contractor of defects subsequently appearing in the work. The contractor, however, cannot reasonably be expected to rectify defects appearing at any time—however long—after completion, and consequently his liability under the defects and maintenance clause is always limited in time.

The clause is in fact in the nature of a guarantee that the work is done so as not to give way through defect in material or workmanship, and may be compared to a guarantee given with, say, a watch or a bicycle, and like such a guarantee is limited to a period in which such de-

fects (if existing) might reasonably be expected to become apparent.

Such is the nature of the usual provisions for the prevention and rectification of defects. But even apart from such provisions in the contract, if the work is inefficiently done, the owner may deduct from the contract price a reasonable sum in respect of defective work, and if payment has been made he may obtain damages for such defective work. See Davis and Hedges L. R. 6 Q. B. 187. And if the work is so improperly done as to be useless, he may decline to pay altogether.

As to time for commencement and completion. The contract usually provides that upon execution or at some fixed date the builder shall be entitled to enter on the land for the purpose only of executing the works, and so as not to create any tenancy or confer any further interest.

If the buildings are contracted to be finished within a certain time and are not so completed, the owner of course will have an action for damages for such breach of the contract. It is, however, usually deemed inexpedient to rely upon this remedy only, and consequently it is usually provided that in the event of non-completion by the stipulated day, a penalty is fixed by the contract of so much for every day beyond, until actual completion. These, unless they are excessive or unless there is something in the contract to show them to be included as penalties in the legal sense, are construed as liquidated damages. See Law v. Local Board of Redditch, L.R. (1892), 1 Q.B. 127.

For the protection of the builder, provisions are also usually inserted to meet the case of delay through unforeseen or unavoidable circumstances, e.g., stress of weather, strikes, disputes with neighbors, etc. In these cases a reasonable extension of time is provided to be allowed by the architect or surveyor. Another cause for extension of time which is usually provided for, though no doubt it would be allowed without express provision, is in the case of extra work being found to be and in fact required.

As to the Consideration or Remuneration. The simplest case is that where a lump sum is to be paid upon completion. Usually, however, at any rate in large contracts, the builder requires money as the work proceeds, and he therefore stipulates to be paid certain sums at certain stages. In both cases it is usually provided that the certificate of the architect shall be required as a condition precedent for payment, and this provision has given rise to various questions as to the conclusiveness of and necessity for the certificate. It has been decided that it is final and conclusive as between the builder and building owner, even if given without reasonable care. Stevenson v. Watson, L.R. 4 C.P.D., 148, and Rogers v. James, 1891, 8 "Times" Law Reports, 67.

This evidently puts great power into the hands of the architect, and much reliance must be placed upon professional honor. The builder has no remedy against him in case of mere negligence or merely unreasonable conduct. In this, however, as in all other matters, actual fraud will give a right to relief, consequently, if the certificate is withheld fraudulently and in collusion with the employer, the builder will have a right of action both against the architect for the fraud and against the employer for work done, even though the certificate be withheld.

It is, however, to be remembered that where the contract provides for payments in advance upon the certificate of the architect that so much work, or work of such and such value, has been done, these interim certificates are not final, and when the time for final payment and settlement comes they may be revised and readjusted, Tharsis Sulphur Co. v. McElroy, 3 App. Cases 1040.

As to the form of certificate; the contract may provide that it must be in writing or in some particular form, but in the absence of such provision it need not be in writing, and may be by word of mouth, and in any form amounting to a certificate, but it must be so expressed as to be in fact a certificate, and not as it were a mere admission.

In the recent cases of Chambers v. Goldthorpe and Restell v. Nye, 84 L.T., p. 444, it was held that the architect in giving his certificate was in the position of an arbitrator, and so not liable for negligence in so doing. Lord Justice Romer, however, dissented from this view, and considered that on giving his certificate the architect was acting simply as the agent of the building owner, and was consequently liable to him for negligence.

Deviations and extra work. It probably but seldom happens that in carrying out works of any extent they are carried out exactly in accordance with, and without any deviations from, the original plans. As the works proceed, either unforeseen difficulties present themselves, or the works themselves suggest improvements in the original design, or the employer alters his mind as to some idea or detail, acting on the principle that it is the unforeseen which happens, the draftsman takes care to provide for such contingencies as are above mentioned.

The two things to be provided for are—

(a) The extra remuneration for the extra work.

(b) The further time to be allowed.

(a) May be fixed either by reference to schedule of prices, or by the surveyor; and as to (b) the contract may stipulate that no further time be allowed, or it may provide that the architect or surveyor may allow such further time as he may think reasonable.

If no such provision is contained in the contract, and extra work is ordered, no penalty can be recovered for delay. See Dodd v. Churton, 1897, 1 Q.B., 562.

It may here be observed that where the contract provides that the architect may order extra work to be done, this does not give him authority to require deviations or alterations amounting to an alteration of the general plan as originally proposed, but only alterations in matter of detail. See Rex v. Peto, Younge and Jervis, 37.

The question frequently arises, What is extra work? and to this the answer is that it is work outside the contract as originally entered into. It is necessary for the execution of that work, although not specified it is not extra and must be done for the price originally stipulated for. See Sharpe v. San Paulo Railway Co., L.R. 8, Ch. 597.

Assignment and subletting of contract. In order to secure the services of a particular builder in whom the employer has confidence, it is usual to provide against subletting or assignment, and also to give power to the employer to determine the contract on the bankruptcy of the builder. In this case, in order to terminate the contract, the employer must do some act indicating his clear intention to exercise the power.

Property in plant and materials. In order to give better security for payments in advance, it is usual to provide that all materials and plant brought on the land shall be the property of the landowner. It would be insufficient merely to give power of seizure upon bankruptcy, for that would not prevail against the claim of the trustee—for this purpose it is necessary to vest the ownership in the employer. Moreover, apart from the question of security, it would obviously be inconvenient to risk the intrusion of the trustee upon the works, and the delay which might be caused by uncertainty as to what he could claim.

Of course when materials are built in upon the land they form part of it and belong to the landowner ipso facto. It is only in the case of loose materials and plant that the provisions against claims by the trustee in bankruptcy are necessary.

Arbitration and prevention of disputes. The contract usually concludes with a clause or clauses, the objects of which are—

(a) To prevent disputes.

(b) To settle disputes.

For the prevention of disputes, the architect or surveyor is sometimes empowered to decide finally, and without being arbitrator. This prevents his decision in the absence of fraud being called in question. But it has been held that where the architect has given to the employer an assurance that the cost shall not exceed a certain sum, he is not considered to be in such a position of impartiality as to render his decision unassailable, and if such facts be proved the builder might claim a greater amount. See Kemp v. Rose, 1 Giff, 258 and Kimberley v. Dick, L.R. 13, Eq. 1.

For the settlement of disputes which may arise, notwithstanding provision for their prevention, an Arbitration Clause in the usual form is generally inserted. It is in the interest of all parties, employer, builder, and architect, that the work should proceed smoothly. Every possible question therefore that is likely to arise should be provided for; hence it is of the utmost importance that building contracts should be very carefully drawn, and, architects, employers, and builders should endeavor to acquaint their legal advisers with any practical difficulty that may arise in a particular case, with a view to its being obviated in the future, whilst the lawyer's part is to carefully watch the course of judicial decisions bearing on the matter, and to frame his contracts from time to time in such a way that the dispute which gave rise to the case in question shall not arise in respect of the contract drawn by him.

Perfection in legal draftsmanship is, perhaps, not possible of attainment, but, if the course I have suggested be taken, we may hope in time and by experience to produce a form of building contract as nearly perfect as it is possible for such contract to be.—H. H. Richardson, solicitor, in the Architects' Magazine.

THE MANUFACTURERS' ARCH COMPETITION.

In the competition instituted by the Canadian Manufacturers' Association for designs for an arch to be erected in Queen's Avenue, Toronto, for the approaching visit of the Duke of York, there were twenty-three competitors representing architectural designers as well as designers engaged in various other occupations. The latter, as might be expected, were at a disadvantage owing to their lack of knowledge of construction. The choice was, therefore, narrowed down to eight or ten designs. The Committee appointed to judge the designs after having spent considerable time in discussion upon their merits, awarded the prizes as follows:—First prize, Mr. C. J. Gibson, architect; Toronto; second prize, Mr. Henry Simpson, architect, Toronto; third prize, Mr. W. P. Witton, architect, Hamilton. These three designs are reproduced in the illustration pages of this number.

Mr. Gibson's design, which has been chosen as the one to be erected, will be 150 feet in height from roadway to top of main flag pole. The arch proper will be 45 feet high and 44 feet wide at the base, the total width from side to side being 100 feet. The framework of the structure will be wood with a covering of staff. The keystone of the arch will represent the Union Jack, with beaver at the base and crown above. On top will be placed an immense globe, with the figure of Canada prominent. The panel at the basis of the fountains and abutments will represent the history of manufacturing in Toronto. The fountains will be decorated with indigenous flora, symbolizing the many lakes and rivers of Canada. All the architectural ornaments will be conventionalized from Canadian floral forms. The voussoirs will contain plants symbolizing various forms of manufacturing. The arch will be strongly colored and richly decorated with flags of all the British possessions and at night will be brilliantly illuminated with electric lights. The coat of arms of the Duke of Cornwall and York will be prominent at each side of the entrance. The approach to the arch will be lined with a colonnade of tall flag-staffs.

The design submitted by Mr. Simpson was placed second and awarded the prize of $100. It shows an arch on all four sides, square in plan, of a purely classic treatment, with Ionic columns, and profusely decorated with festoons of evergreen leaves, the electric lights following the lines of the evergreen, entwining around the columns, carried across and around the pediments, drooping centre to outer flag poles and otherwise. The south side of the arch is approached from College street by a line of Venetian masts on each side of roadway connected with evergreen festoons, electric lights, etc. Each flag-pole is decorated with flags and shield, etc. The structure proper is designed to be built of staff painted in rich, warm colors surmounted by a rich green dome. The architect in planning his design has given careful consideration to the silouette, the general effect and its suitableness to such a festive occasion as the reception to the Duke and Duchess of York shall be.

Mr. Witton's design shows the decoration of the street by a series of masts draped between with bunting and finishing with a triumphal arch at the south end. The arch and the bases of masts to be of staff. The tenders received indicated that the work would cost about $5,350.00.

AWARDS TO CANADIAN ARTISTS.

Among the awards announced by jury for the division of fine arts of the Pan-American Exhibition are the following to Canadian artists:—

Group 1 (136), class 577, paintings in oil, water color, pastal, and other recognized mediums, miniatures, cartoons:

Gold medals—William Brymner, Robert Harris, Homer Watson, W. Blair Bruce.

Silver medals—E. Dyonnet, E. Wyly Grier, John Hammond, Laura Muntz, James Wilson Morrice.

Bronze medals—Maurice Cullen, William Cruikshank, Edmond Morris, A. D. Patterson, J. St. Charles.

Honorable mention—M. A. Bell, F. M. Bell-Smith, F. H. Brigden, Florence Carlyle, J. W. L. Forster, J. L. Graham, Robert F. Gagen, F. McGillivray Knowles, C. M. Manly, Mary H. Reid, S. Strickland Tully, Paul Wickson.

Group 2 (137), class 578, sculpture, including medals and cameos:

Silver medal—W. S. Alward.

Not in competition as member of Jury of Awards.

Group 1 (136), class 577, paintings in oil, water colors, pastel, and other recognized mediums, miniatures, cartoons—George A. Reid.

The awards in the section of architecture have not yet been made owing to the difficulty in bringing the jury together in Buffalo.

A PLEA FOR ATTRACTIVE FACTORY BUILDINGS.

Mr. J. P. Murray, a prominent member of the Canadian Manufacturers' Asssociation, states that the doctrine that factory buildings may and should be made architecturally attractive, is being impressed upon the attention of the members of that important organization. We imagine that we are primarily indebted to Mr. Murray himself for this commendable step. He has long been an ardent and useful advocate of the wisdom of uniting utility with beauty. The factories of the Sunlight Soap Co. on Eastern Avenue, and the City Dairy Co. on Spadina Avenue, Toronto, are an evidence that factory buildings need not necessarily be coarse and ugly structures, but on the contrary that they may be endowed with features of beauty and interest.

Much unfavorable comment has resulted from the announcement in the press that the contract for redecorating the residence of the Governor-General at Ottawa, has been awarded to a New York firm. The opinion prevails that this work could have been as successfully done by Canadian artists and workmen.

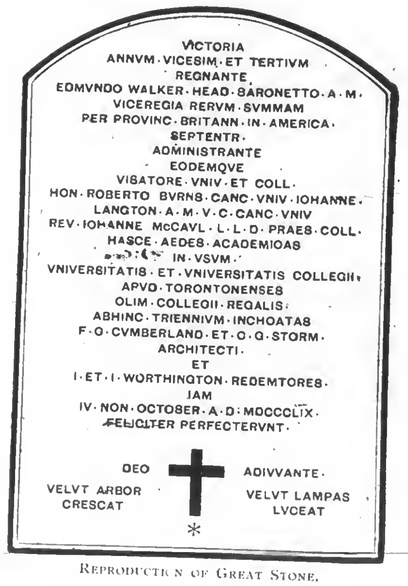
At a congress of architects recently held in Dijon, the conlusion was arrived at that carbonate of lead should not be adopted in house painting. The opinion of the other architectural societies is to be sought in order to ascertain whether a substitute cannot be discovered. The material has been often condemned, but still white lead is most generally employed not only as a pigment but as a base for other colors.

China and Japan are now utilizing their materials for cement, and they have the advantage of being able to deliver supplies in California thirty days after the order has been received. The Irish laborers who are employed in connection with the shipping have an aversion to carrying Chinese goods, but they are easily conciliated by having green labels placed on the bags, and by labeling the cement as "Portland."

THE STORY OF A UNIVERSITY BUILDING.*

Memory has environed many an ancient ruin with the annals of its past, clothing the hoary and mouldering stones with life as does the ivy which hides the progress of its decay. When admiring the magnificent buildings of early centuries the spectator finds not a little of his interest fanned by learning the history of the men who conceived and built them, and in tracing the soul-marks which these men left upon them and the ideas which they endeavored to express. Often the very times and moving impulses of successive periods may be followed in the great Cathedral and Monastic buildings where piety and wealth have age after age each added its quota to the original edifice—the rude, unchiselled solid arch, the massive walls and narrow crenelated windows, the simple rounded columns, whose beauty is in their strength, pass onward into more moulded forms and more sun-lit space. Asylum from pursuit gives way to consciousness of freedom, and decoration tells of immunity from ruthless invading hands. So studied, they become more than mere masses of architectural interest.

In a new land like ours where buildings grow apace and forest trees are lone records of a previous century, it is well to note whatever we can of the motives which moved



REPRODUCTION OF GREAT STONE.

the builders of our earlier days, and so attach the memory of their intentions to the visible products of their skill. In such spirit this record is made.

We have in Canada no single building in whose walls the course of history may be traced, yet in the buildings of Toronto University we have the reminiscence of an eventful period in the history of the University itself, and an untrammelled effort to create and preserve the ideals which impelled its founders.

On a great stone set in the inner walls on the second story of the main tower, and which, fortunately, was not destroyed by the conflagration of 1890, is preserved the names of those under whom the building was erected. This stone is reproduced herewith in such imitation as is possible with type. The Latin inscription was probably the work of the erudite Rev. Dr. McCaul, then president of the college, and a world-known authority on ancient inscriptions.

The Governor-General of Canada at the time, and by virtue of his office, Visitor of the University, was Sir Edmund Head, a man of cultivated taste and high scholarly attainments. He had at one time himself been a professor at Oxford, and was ardently imbued with the desire of aiding in the foundation of a broad laid and permanent University in the country to which he had but recently come in 1854. His views were clearly expressed in a speech delivered by him in Quebec when he said, "an endowment such as that enjoyed by the University of Toronto is a most valuable element in the future progress of this country. Such an endowment once lost or diverted to other purposes is not easily recovered."

The Latinized names of the Chancellor and Vice-Chancellor and of the Architects and Contractors are also recorded in the inscription.

Mr. F. W. Cumberland, who had been a student under Sir Chas. Barry, had, after coming to Toronto in 1847, engaged in the practice of his profession as an architect. The present St. James' Cathedral commenced in 1850, to replace its predecessors which had been destroyed by fire, is one of the early examples of his work. In the original design of this building, a choir of ample proportions was proposed between the Apse and the main body of the Church. But this for motives of economy was omitted from the construction, and the Apse moved forward to abutt, as it now does, upon the great arches of the Nave. Even in its present form the Church is still considered an excellent example of applied Perpendicular Gothic. The spire, which was subsequently completed in accordance with his designs, forms one of the graceful landmarks of the city. This and the severely classic and pure Ionic form of the present Receiver-General's office, were executed while Mr. Thomas Ridout was a member of the firm. In 1851 he was nominated a corresponding member of the Royal Institute of British Architects, and subsequently associating with himself Mr. W. G. Storm, of Toronto. The Normal School and the central part of Osgoode Hall are after works of the new firm.

Here it will be well to note the condition of University matters in Upper Canada precedent to the erection of the University buildings.

King's College, created in 1826, the first endowed University of the Province, had been passing through its phases of change and strife. In 1849 its name had been changed to that of the University of Toronto. Since its original inception other universities had been established in the Province and finally, in 1853, to meet the changed conditions, a division was made of the duties in higher education to be performed by the Provincial University. University College was then first created, to be a teaching Faculty in Arts, having a separate governing body, and a distinct entity as a purely College foundation.

To the University of Toronto, the "abstract entity," was transferred all the University powers of the original creation, such as the holding of examinations, the granting of degrees and the regulation of academic standards. Provision was made in the Act of 1853 for the Federation with this Degree-conferring University of the then existing Universities of the Province, such as Victoria, Trinity, and Queen's, and of such other teaching Colleges as should be qualified to be joined. These separate units of University energy and education, each retaining its own particular individuality, would, it was hoped, together with University College, in time be joined in union with the central University which was to become a part and the elevated representation of them all. Such was the ideal of the men of that day.

For many years the abode of the Provincial University had been the shuttlecock of fortune. Five times in seven years had its quarters been changed. Turned out of the King's College buildings which it had constructed, it was transferred to the Old Parliament buildings on Front St., thence, on return of the Government to Toronto, back again to King's College. Later, it was again moved to the old Medical School whose site is now occupied by the Biological building.

Nor was it more happy in the possession of the remaining lands which had been granted for its use. Under the Reconstruction Act of 1853, the Government had taken power to appropriate out of the University property which had been granted for Collegiate purposes at the head of College Ave., "sites for a Government House, a Parliament House, and Buildings for the accommodation of the Public Departments." The necessity for securing its lands and obtaining a permanent home was, therefore, deeply but quietly engaging the thoughts of the University authorities.

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A solution of the division of the property was at length arrived at and when it was determined to erect new buildings Mr. Cumberland, who had been a member of the Senate since 1853, resigned his position and was appointed architect to the University, Mr. Storm being then a member of the firm. At the instance of the Senate Mr. Cumberland in 1855 again visited Great Britain and the Continent, and for nearly a year made special study of University and other architegural buildings and of their adaptation to our means and climate.

The finished conception both in the massing of the grand yet reposeful outlines of the exterior and the elaborated parts of the University buildings are the results of his wide investigations and of the mass of detailed studies which he made in preparing for what he considered a work worthy of the highest art. The preliminary plans were then prepared, and quietly in the presence of a few members of the building committee, on the morning of the 4th October, 1856, the first stone was laid, and thereafter the building grew.

It was the expressed intention of Sir Edmund Head, Vice-Chancellor Langton and the active members of the building committee that the edifice should be one which should cellence around which the aspirations of the new University just created might in future days cluster, and so, under the influence of its outward home, grow in artistic and intellectual strength.

GROUP OF CARVERS—FROM A PHOTOGRAPH TAKEN AT THE TIME OF THE ERECTION OF THE MAIN BUILDING OF THE UNIVERSITY OF TORONTO. IN THE CENTRE OF THE GROUP, BAREHEADED, IS ZOLIKOFFER THE MASTER SCULPTOR, WHO WAS BROUGHT WITH HIS ASSISTANTS FROM GERMANY TO DO THIS WORK. THE CARVINGS ARE SOME OF THE ENRICHMENTS OF THE CONVOCATION STAIRWAY.

Surplus University revenues of considerable amount had been accumulated, so there were ample means on hand with which to proceed. Sir Edmund Head took a daily interest in the structure; his personal instructions were, as told to the writer: "Spend all the available endowment, or as much of it as you well can, for, if you don't, some people will some day come along and want to fritter it away for other than University purposes. We will anchor the endowment for the University by spending it on its buildings."

Sir Edmund found in Mr. Cumberland an architect after his own heart. Under these influences the edifice grew not only as a collection of rooms for educational purposes, but as a permanent example of noble architecture. While the nature of modern requirements in light and space in the interior modified in some degree the outer plan, yet the Norman-Gothic style of the design remained dominant in the architectural key of the exterior, and in the finish of all the details of its parts. Although adapted to modern uses the composition is one of absolute architectural values, and is the result of intensest study.

As in a landscape framed by nature all the surrounding ranges seem by intuitive relation to lead to the summit height, so in the University buildings the eye is imperceptibly, yet by carefully planned steps led up to the dominant feature of the design, the great Norman Tower. While apparent balance is maintained in the wings and on either side of the principal southern façade, yet there is no commonplace repetition. In many buildings one wing is but the reproduction of the other, a repetition on either hand of the same construction; but in this by tower or by gable, by minaret or change in form or grouping of classic windows, an artistic variance is introduced, while the relative proportion is preserved. None of these varintions are obtrusive, none abstract the eye from the general design, each while revealing its own individuality is honorably subordinate to the general duty of faithful service in promoting and leading to the central glory of the whole. From whatever point of view the edifice be approached, this lesson of highest ideal is declared in the storied stone. Such was the general scheme.

In carrying out the details of the building the utmost fidelity was maintained to the best examples of the ancient style.

In the old building, the major portion of which has been preserved, there were no two carvings the same, no two capitals, no columns, no enrichments repeated. Each detail is a separate study, and the wealth of invention and the art of workman and architect found in the mediaeval buildings is equally here to be found. Skilled art-carvers were collected, the master sculptor and his chief assistants being brought from Germany. A special study of the excellence with which they executed their work and produced the designs of the architects will serve in this one building to give an education obtainable only by much difficult and distant wandering.

One glory of the old interior, the stone stairway with its antique roof near the Convocation Hall, has unfortunately passed away with the conflagration in the building.

Here was lavished a very wealth of carving which would have been worthy a pilgrimage to visit. The enrichments were in Caen stone wherein bird forms interlaced with foliage executed in minutest detail were introduced, and examples of the grotesque carvings prevalent to the style produced both in wood and stone. Many other examples of worthy carvings are still extant in the

remaining part of the building, but this Convocation stairway was one of the architect's delights.

It was a happy fortune that the exterior of the building, and particularly the magnificent central door of the Great Tower, came through the flames unharmed. While every part of the exterior stone had received its due share of artistic enrichment, on this has been concentrated the full rendering of the best ancient art.

The East door, in rich but simple outlines, leading to where was then the Convocation and Examination Hall, speaks of severity and accurate learning; the little Western door, hidden behind its pillared cloister enriched with grotesque carvings, whispers of academic quietude and privacy, but the noble Norman portal beneath the massive Norman keep dominates in majesty and design all other openings, and fitly acclaims its place as the principal entrance to an enduring and classic Hall of learning.

Conceived with such ideas and intentions, and executed in such manner, it can easily be understood that the original estimates for the construction of the buildings were far exceeded. To Mr. Cumberland had come the share of planning and designing, of creating the composition, the selection and invention of the adornments of the Norman style; with Mr. Storm was the execution of the works and the honorable care of construction. Both lavished their best in performing the duties of their profession.

The authorities, however, declined to pay them for the extra services they had given, due to the increased character of the work and of the wealth of artistic detail which had been added to it. Hurt at this want of appreciation of artistic effort, and affronted by the refusal of his claim, amounting to between five and six thousand dollars, a large amount of which had been expended in preparing full-sized drawings for the carvings, Mr. Cumberland abandoned the profession of architecture and betook himself to railwaying, in which he had at intervals been interested, and the University building was the last architectural work in which he engaged. Mr. Storm continued in the practice of his profession, Victoria College, built in 1892, being one of the principal works which engaged his subsequent attention.

In comparing the University buildings with other edifices which have been executed in this city, it is to be remembered that since then the utilitarian has largely overmastered the artistic. The cost of construction is more thought of than the creation of architectural expression, and architects are not encouraged to devote to architectural effect so large a portion of the expenditure of construction nor given scope to develop the artistic side of their profession. When they are granted this liberty then abiding and adequate results may be obtained.

In the buildings of the University an endeavor was made to adapt the best mediaeval Art and to represent academic ideas in visible form. Speaking at the celebration held on the occasion of the placing of the copestone on the Tower, on 4th October, 1858, Sir Edmund Head "congratulated the architect upon being the first to introduce this style of building upon the Continent, there being, so far as he was aware, no instance of Norman or Romanesque style of architecture in America. He believed the style capable of producing many useful results. It was the adaptation to modern purposes and uses of the community now existing of the style of an early day. It was the history of modern civilization."

That some success has been obtained would seem to be inferred from the fact that the buildings, although shorn by fire of some of their early adornments, much of which was however faithfully restored, yet continue to be a source of study to those who are architecturally and artistically inclined and after fifty years are still regarded as one of the finest examples of applied Gothic architecture on the Northern Continent.

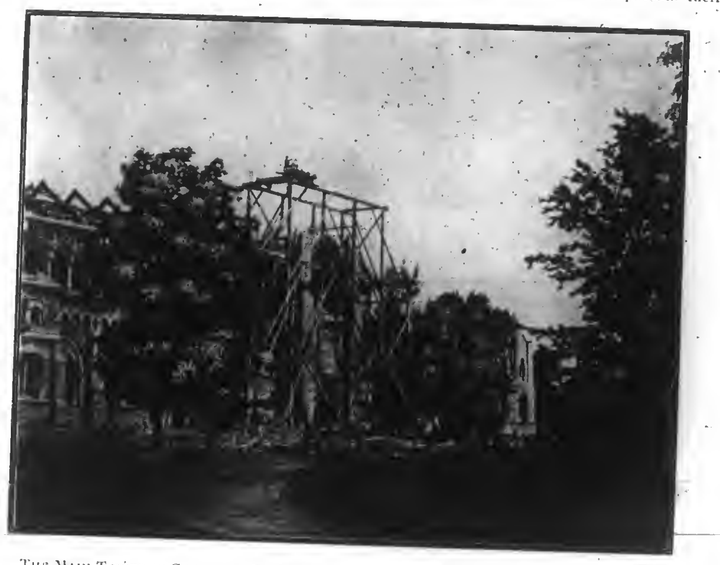
Whatever they may be to the general public, they were intended to stand as a lesson and an inspiration to all interested in academic culture. Not by rigid repetition nor cold uniformity are the several parts massed together, but as the associated Colleges, each governed by its own methods and contributing its special school of culture, would join in harmony to strengthen and elevate the value of University Education, so the several groups of the buildings, each separate in treatment and perfect in itself, were blended in union to add glory and support to the general design.

As the Great Tower concentrated the proportions of these, so were the colleges to found the character of their Federated University, each giving of its best to lead upward in the noble cause.

To the students who enter its portals their Alma Mater speaks in no uncertain way. As they are the living stones which build her reputation, so her habitation expresses what they themselves should be. Every stone is true; no false stones or veneer, but true stones built deep into the wall, each being what it looks, and truly doing its ungrudging share of duty. Anyone who saw the massive blocks which were built into its walls will understand how, when the fire swept through it, the building bore the stress and the mighty Tower, though shorn of its interior, stood scathed, but firm. It was built as builded the Norman builders of old.

And decorated stones there are, like students who win renown. Under the cornices around the whole building are series of carved stones and on all the capitals and enrichments, yet no two the same; even the wooden capitals of the cloister of the inner quadrangle are each cut in different forms, yet all these special stones are moulded according to the same architectural school, fit examples of the pervaging period of the design. Individuality of manhood is not lost in the student, from whatever college he may come, but is marked in scholarly eminence, as are the carved stones in the walls of his University.

May it not be that the hopes of the period they mark may some day be realized and that like the great buildings of older lands, those of Toronto University may become cherished memorials of formative days, an inspiration to the men who come within their influence, and to works of value in the progress of our country.



THE MAIN TOWER IN COURSE OF ERECTION—THIS PHOTOGRAPH SHOWS THE TREES WHICH WERE CAREFULLY LEFT IN POSITION AND PRESERVED TO ADD TO THE APPEARANCE OF THE BUILDING. ALL THESE HAVE SINCE BEEN REMOVED.

BRITISH COLUMBIA LETTERS.

No. VII.

The Second Annual Exhibition of the Arts and Crafts Association was held in the Fairfield Block, from June 28th to July 5th, and though the collection of works of art was probably the best ever brought together in the province, so little interest was taken in the show by the public that it was, financially, a complete failure. In a town of 25,000 inhabitants a collection of paintings, including examples by George Moreland, Gerard Dow, George Fripp, Albert Hartland, Knowles, Ferrier and others of greater and lesser note, such a collection remaining open to the public for seven days, attracted an average attendance of 30 per diem. A nigger minstrel show would have drawn five hundred.

However, if one cannot congratulate the people of Vancouver on their powers of discernment in matters of taste, the officers of the Association must feel that the want of success of the exhibition was certainly not due to any lack of energy or enthusiasm on their part.

The numbers of and the interest in the works by local members was not equal to the last year's exhibition. Mrs. Marcus Lucas, whose clever painting and well chosen subjects were a notable feature in the show of 1900, was represented by but a few oil paintings surrounded by a draping of black and violet, the Association having been robbed by the Destroyer of this admirable artist and enthusiastic supporter but a short while ago. Mrs. Marcus Lucas will long be remembered and her loss deeply regretted by all lovers of art in this city. Mrs. Ellis' charming work on china was this year represented by but half a dozen pieces, of which we most admired two plates designed by Mr. Jas. Bloomfield. The Misses McLung having left Vancouver just before the opening of the exhibition, were both unrepresented, as also was Miss Marstrand, whose work in black and white was greatly missed, as well as her quiet but effective assistance on committee. Others who contributed last season have withdrawn, and consequently the Asscciation has had some difficulty in maintaining the local character of the exhibition. Still, Mrs. Balfour Kerr and Mrs. Lionel Williams were well represented in oil colors, and Messrs. DeForest and Ferris each sent a number of characteristic works in the same medium. Mr. Tom Fripp's "Venetians Threading Beads" is a new departure for him. In water colors, Mr. Ferris showed but four small drawings, while in this class the only other exhibitor was Mr. Tom Fripp, whose large drawing "Chill October" is the most important work that artist has shown here. His sketches "Venice" and "Burrard's Inlet," are full of light and atmosphere. In black and white, the same artist was the sole contributor, principally portrait studios in chalk or pencil. In china Mrs. Ellis, Mrs. Harry Burrows, Miss Ede (who gained Mrs. R. B. Ellis' special prize), and Miss Drainie showed some beautiful work. Miss Drainie's fish set, accompanied by the clever designs prepared for this set by Mr. Jas. Bloomfield, is an exceptionally charming piece of keramic ware. It is good to see that conventional design is receiving much greater attention, though there is still far too much of the mere representation of fruit and flowers with little if any attempt at decorative treatment.

A screen of water colour sketches by Mr. Francis Caulfield was of very great interest, comprising a wonderfully wide range of subject: "Richmond on Thames" is a distinctly clever piece of difficult perspective; "Hampton Court" is scarcely less so; "The Chestnut Avenue, Bushy Park," is well contrasted with "An Orange Grove, California." Mr. Caulfield again showed his delightful piece of carving in oak, a panel entitled "Dolphins Plunging Through Water," which is full of movement and vigor.

Mrs. Balfour Kerr and Mrs. Lionel Williams had a screen of embroidery, some of it extremely well designed and executed. It seems somewhat strange that there should be so very few contributors in this most interesting class of work.

Mr. Harry Burrows chip carving and burnt work was most favorably commented upon, his cabinet and an occasional table being the most excellent examples of his skill. Mrs. Burrows also showed some pretty calfskin cushions with pyrographic decoration. Messrs. Henry Bloomfield & Sons were represented by a couple of stained glass windows, one, of which the motif is gold fish and kelp, being as fine a piece of color and drawing in lead and glass as we have seen for a long time. Mr. Jas. Bloomfield also showed some cartoons and a folio of delightful schemes in leaded glass; judging from some of these it would appear that this artist is finding more and more to interest him in mosaic treatment, some of the designs being for absolute mosaic in glass and lead without painting.

The only architectural drawings on the walls were by Mr. R. M. Fripp, F.R.I.B.A., Vice-president of the Association, among them being three drawings lately exhibited in the Royal Canadian Academy or Arts Exhibition at Toronto: a design for oak sedilia to be built for St. James' Church; a fumigated oak sideboard and drawing room fitments also in fumigated oak, designed and executed for Mrs. D. G. Marshall, also designed by Mr. Fripp, were the only designs for furniture in this exhibition of arts and crafts.

The newly constituted Manual School had an interesting exhibit kindly loaned and arranged by Mr. T. Northrop, the principal.

The school children's competition did not show any decided advance over last year's form. Many of the drawings were obviously not from Nature, and in some classes there were no entries and some of these classes will probably be dropped next year. The following is the list of prize winners:—

Class A.—Sec. 1.—Edith Wright; Sec. 2.—Vivian Garvey; Sec. 3.—Rhoda Macrae.

Class B.—Sec. 1.—Maude Tregent; Sec. 2.—Erma. Hurst; Sec. 3.—Violet Henderson; Sec. 4.—Hester Barker; Sec. 5.—Mabel Tregent; Sec. 6.—Harold Ferguson.

Class No. 5.—Ross Fraser.

For pupils of the MacDonald Manual Training School:—No. 1.—Gordon Johnson; No. 2.—Ernest Macready; No. 3.—C. M. Braden.

A special prize for landscape drawing in pencil was awarded to Jessie MacDonald and Mrs. R. R. Ellis' prize for painted china, open to students only, was won by Miss Ede, with some particularly well drawn conventional designs in extremely pleasing color.

The loan exhibition was a very varied and interesting collection of oil and water color paintings, pastels, engravings, Sevres china, curios from every quarter of the globe, and a few but excellent examples of ancient and modern printing. "Pigs Feeding," by Geo. Moreland, "The Poultry Vendor," by Gerrard Dow, "The Whist Party," a reputed G. Dow, and "Tam O'Shanter" by David Ferrier, were a singularly fine group of oils. A very slight portrait sketch by John Ruskin was kindly lent by the subject of the sketch, Mrs. G. Edwards. A pair of very beautiful seascapes in pastel by Holden (lent by Dr. Mostyn Hoops), were greatly admired, the broken water and driven clouds showing vigor in their handling, impression of wind and sunshine, cloud and shadow being rendered with fine skill. A large water color drawing by Albert Hartland (lent by W. E. Chapman) was a good example of this painter's later work; the subject "Lake Killarney," is world famous and the soft atmospheric effects were charmingly rendered. Two very early examples of Hartland's were interesting, but did not show much of the breadth and skill of the larger work. Three lovely little drawings by the late Geo. A. Fripp, R. W. S., were lent by his son and pupil, Mr. Tom Fripp; of these "Norfolk Broads" was the most finished and characteristic of this master of the grand old school of water color painting, but the others were also so delightfully warm and luminous it is hard to dogmatise as to their relative value. Colonel Falk Warren lent a collection of prints, one of them, an undoubted Al Trecht Drer. A number of Wouverman's and other Dutch draughtsmen, together with some excellent steel engravings (most unfortunately robbed of their margins), made up a deeply interesting and highly instructive set. The association was also indebted to Mrs. Marstrand for a capital pen and ink drawing by Prof. Marstrand and several oil paintings by Danish artists, of which we preferred "Mentone" by Prof. Zacho.

A gothic blackletter Bible (Portuguese) dated Lisbon, 1526, and printed by Huysman, (lent by Mrs. MacLagan), and some good Royeroft and Mosher books formed a small but select company in a glass case.

Seypores, Binares, Moorish and Japanese metal work, Fijian clubs and Karu bowls; Cloisonne placques and vases: Tibetan, Korean, Indian, Afghan, Samoan weapons; Lucknow silverware, Chinese embroidery, Zulu bangles, Japanese armor; Kaffir pipes, girdles, necklets and Australian Blacks boomerangs and spears; paddles from the Solomon Islands, New Guinea drums, Suivash basket work, elk teeth girdlers, mud pieces and many other odd, quaint and curious things, each and every one of which betrayed skill in their production, art in their decoration, often amounting to art of high rank, all these things carefully marked and catalogued, displayed on walls, benches and screens, wanted but one thing to make the exhibition a complete success and that one thing, intelligent appreciation, the public of Vancouver did not give, probably because they have it not to spare.

STUDENTS' DEPARTMENT.

ARCHITECTURAL EDUCATION.

At the recent convention of the Architectural League of America, short papers were presented by representatives of the various clubs composing the league, treating of different phases of the subject of the proper education of architects, which had previously been assigned to each club for consideration. For the Toronto Architectural Eighteen Club, Mr. Wm. Rae contributed the following as the views of the club on the questions submitted to it, which were :

"How much mathematical and engineering training should an architect have ?"

"Should design and construction be separated so as to train specialists in each of these lines ?"

(A). An architect should have as much mathematical and engineering training as will enable him to solve, by means of formulas derived from the experimental research of scientific experts, every problem the erection of a modern building may involve in the safe and economical use of the materials of its construction, including steel construction, heating, lighting, ventilation and sanitation.

In considering this question we have borne in mind the difference between education and merely a knowledge of the expedients of modern practice, for these expedients vary so much in different localities and change so from time to time, so many men devising their own, and ever learning fresh ones, that we think no rule may be laid down concerning them.

The use of formulas and tables thus derived we think one of the most justifiable expedients of modern practice.

The architect's work is the harmonious association of all the crafts, which harmony can only be considered complete when the possibilities of each craft in relation to the whole are perfectly developed, and to do this a knowledge of the nature and functions of every material used is necessary.

(B). Design and construction should not be separated, so as to train specialists in each of these lines, because a specialist is one who, in addition to the ordinary knowledge of his craft, acquires a special knowledge of one line, not one who has acquired a knowledge of one line only of the general knowledge of his craft.

Design in architecture is surely, as seen in the study of the highest design—the human figure—constructing beautifully. Certainly, the most intellectual part of the aesthetic satisfaction derived from the contemplation of the human figure comes from the perception of the harmonious grace of its constructional requirements.

Could we imagine a figure built up of compression members covered with tension-members and concealed beneath a coat of ornament ?

What we understand by architectural design has to be based upon the use of some material ; to what material shall we limit it ? Stone and wood only ? We do not know what the material of the future may be ; there may be no stone or wood. Times change, and we must change with them.

EXAMINATIONS AT THE ECOLE DES BEAUX-ARTS.

The spring entrance examinations of the Ecole des Beaux-Arts are unlike any others outside of Paris. For six months previously, says the London Architectural Record, the ateliers or studios are filled with men preparing for these examinations. Early on the chosen day the streets in the Quarter are filled with men carrying drawing boards and other utensils, and when at eight o'clock the gates of the Ecole are thrown open hundreds of young men file in, shouting at the top of their voices. As his name is called each goes past the guard and up the stairs to the little rooms, or loges, to secure a place in which to do his work. These loges are about 10 feet by 12 feet each, and hold six men comfortably. They are by no means ideal working-rooms, being dirty and ill-lighted, and opening off a long narrow passage; altogether they are about as uninspiring as one can imagine.

To the average person the idea of an examination suggests an ordinary room, presided over by a dignified professor with the utmost quiet prevailing, so that one can almost hear the scratch of the pencil. Who can picture an examination held while hundreds of men are singing, whistling or yelling and running up and down a passage ? Yet this is just what happens at the Beaux-Arts when the men are making the sketches of a given subject (required to be completed in twelve hours) which determine whether or not they shall enter the greatest architectural school in the world.

The uproar is constant, the noise deafening. From the moment the men assemble in the court till the last one leaves the school at night this noise is constant. First one set and then another takes it up. One wonders that any work can be done.

At the last examination there were no professors in sight, only guardians, whose principal occupation seemed to be to sell food and drink to the students and afterwards to dispose of the beer and wine that were left. As a result, at about four o'clock the guardians, who were supposed to see that the men did not make use of books or photographs, were assembled in one of the vacant rooms discussing politics and drinking and adding to the noise made by the students.

But notwithstanding all the apparent drawbacks the drawings were being made. After studying all the morning on the schemes, most of the men would eat and then start on the finished sketches. As time went on and darkness set in out came candles, for there is no gas or electric light in the rooms ; and about six o'clock some of the men handed in their finished work. Others, a little pressed for time, would be working with a will to finish before it was too late. When a party of visitors make their appearance at the door of this loge the busy one would call out "Charette !" And this would be respected, for it means, "I am in a hurry ; need all my time. Don't bother me." At eight the guardians collected the drawings, most of which were completed. Then the men went out, still shouting.

On Sunday the professors went over all the drawings and marked them. On Monday afternoon the results were announced. As early as 4 p.m. hundreds of men assembled in the court of the Ecole to wait until the doors were opened at seven. If noise prevailed before, it was nothing compared with that which now was heard. With nothing to do but wait, and with every nerve strained in expectation, it is perhaps excusable if the 500 young men let themselves loose.

Finally the doors of the great hall were thrown open and the men crowded in. The noise was stilled in an instant, and one could almost have heard a pin drop as the names of the men and the marks they received were called out. Thus the examination was conducted.

Salisbury Cathedral has the same number of windows as there are days in the year, is built in the early English style. They are triple windows, formed from an elegant combination of three lancets :

"As many days as in one year there be,
So many windows in this church we see ;
As many marble pillars here appear,
As there are hours throughout the fleeting year ;
As many gates as moons one year does view—
Strange tale to tell ! yet not more strange than true."

In the United States and also in Europe efforts are being put forth to secure the enactment of laws to provide for the examination and licensing of architects. The Council of the Society of Architects of London, in view of the Bill for the Registration of Architects now before the British Parliament, have held a series of meetings of architects in various towns throughout Scotland. Similar meetings have been held throughout England to ascertain the attitude of the architects on this important subject. The meetings were open to the public. With the growth and success of the movement for registration in other countries, should eventually come the amendments which are required to make the Ontario Architects' Act a workable and useful measure.

METHODS OF CONSTRUCTION IN RELATION TO COST OF INSURANCE.

The Underwriters' Association of Canada at a recent meeting decided to extend to the towns and smaller cities throughout the country the rule under which buildings are classified for insurance purposes according to the character and surroundings of the building. This system has been employed for some time in Toronto and is generally acknowledged to be the most equitable one. It is obviously unfair that the owner of a building belonging to a certain class who takes precautions to guard against its destruction by fire should be obliged to pay insurance at the same rate as another owner in the same class who takes no such precautions. The situation and surroundings of a building also have much to do with its desirability, or otherwise, as a fire risk. These circumstances ought to be taken into account by the insurance authorities when fixing the rate of insurance to be paid. The more strictly this system is applied the more general will become the construction of fire resisting and fire-proof buildings. It is said, on the authority of prominent insurance firms, that, during the last five years, the rate of insurance on this class of building in Toronto has been reduced by 50 per cent., which should certainly offer a strong inducement to persons proposing to build to employ fire-proofing methods and materials. Care should be taken, however, to see that when these materials are employed, the system of fire-proofing is carried far enough to place the building in the favored class. Prominent buildings have been erected in Toronto within the last three years in which the ceiling and floors have been fire-proofed while the stairways have been left open to act as flues and cause the destruction of the building in case of fire. A partial system of fire-proofing like this which disregards essential features, such as those mentioned, is valueless, and the money expended on expensive materials wasted. The record of fires in Toronto last year is very gratifying. The total number of fires was 686. For 328 no losses occurred, and for 221 the loss in each case was less than $100. The losses above insurance totalled only $13,289, and the losses without insurance to only $9,434. Only one fire extended beyond the building in which it started, which would seem to point to a high standard of efficiency of the fire department. To what extent improved methods of building construction contributed to this excellent showing is not known, but it may reasonably be presumed that some credit is due in this direction. The record of fire losses in the United States for the first six months of the present year shows the total losses to have been $88,935,000, as compared with $103,299,000 for the corresponding period of last year.

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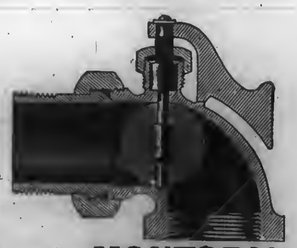

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THE DANGER OF PUTTING STRUCTURES TO NEW USES.

The partial failure of the Brooklyn bridge recently is another evidence of the danger which attends the imposing upon structures of duties which they were not originally designed to fulfill. The designer of this bridge had no thought that electric and cable cars would be run over it, and made no provision for such a contingency. Consequently, as the result of the extra strain imposed by the street car traffic, some of the rods have snapped, causing a sinking of the roadway, and necessitating the closing of the bridge to traffic. Many accidents from the same cause have happened, causing the collapse of bridges and buildings. It is quite a usual practice to put buildings to uses differing entirely from those for which they were designed, and to impose loads upon the floors many times in excess of those which they were intended to carry. The wonder is that in so many instances they manage to stand the strain. In view of this practice of overloading, architects should be careful in designing buildings for business uses to employ a factor of safety sufficient to cover all ordinary contingencies of this kind which are likely to arise.

The Ontario Portland Cement Co., Limited, has been formed at Brantford, with a capital of $450,000. The management is in the hands of President, E. L. Gould; Vice-President, W. S. Wisner; Secretary, E. Taylor; Directors, H. Cockshutt, A. Bixel, W. G. Elliott and the president and vice-president. The company propose to utilize marl deposits at Blue Lake, near St. George.

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WHO SHOULD LAY THE DRAINS.

For many years the custom prevailed among Toronto architects of placing in the mason's specification the construction of house drains. Since the enactment of plumbing by-laws, which compel the plumber to furnish to the owner a certificate that the drainage system has been inspected by the Health Department and found to be tight, some architects have thought it advisable to place all drainage work in the plumber's specification, so that they would have but one contractor to deal with. Other architects continue to follow the old plan, believing that it is to their advantage and that of their clients to do so. It is argued that the mason who has the putting in of the foundation of the building is more likely to carry out the drainage work in a more satisfactory manner than is the plumber who comes along after the foundation work is completed and is obliged to break away part of the foundation in order to make his connections. In a majority of the large cities on this continent, it is now the practice of architects to include the drainage work in the plumber's specications, for the reasons mentioned.

There is believed to be a good opening for brick manufacturers at Dawson City, where brick is now replacing wood for building purposes. Valuable clay deposits suitable for brick making have recently been discovered in the locality.

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PROPOSED PUBLIC LIBRARY FOR MONTREAL.

Considerable comment has been aroused by the action of the Mayor of Montreal in making a request to Mr. Andrew Carnegie for money with which to erect a Public Library in that city. In reponse to the request, Mr. Carnegie has offered to give $150,000 for the erection of a building on condition that the city shall provide a site and expend $15,000 per year for maintenance. The consensus of opinion in Ontario at least appears to be that it is not becoming to the dignity of a wealthy community like Montreal to ask outside assistance towards carrying out a public undertaking of this kind. If Montreal feels its need of a Public Library its citizens are abundantly able to supply the necessary unds for its erection, and by doing so they would better mainain the self-respect and dignity of the chief commercial city of Canada.

ANCIENT MEASURES.

The measures of length used in the Bible, with their equivalents in our modern use, are given by an English contemporary as follows: The great cubit was 21·888 in., or 1·824 ft., and the lesser cubit 18in. A span (the long), half a cubic, or 10·944 in., 0·912 ft. A span (the less), one-third of a cubit, or 7·296 in., or 0·608ft. A hand's breath, 1·6 of a cubit, or 3·684in., or 0·304 ft. A finger's breadth, 1·24 of a cubit, or 0·912 in., or 0·076 ft. A fathom, four cubits, or 7.296 ft. Ezekiel's reed, six cubits, or 10·944ft. The mile 4,000 cubits, or 7,296 ft. The stadium, one-tenth of their mile, or 400 cubits, or 729·6 ft. The parasang, three of their miles, or 12,000 cubits, or four English miles and 580 ft. A day's journey was 33·164 miles, some say twenty-four miles. A Sabbath day's journey, 3,500 ft., or, as some authorities contend, 3,648 ft.

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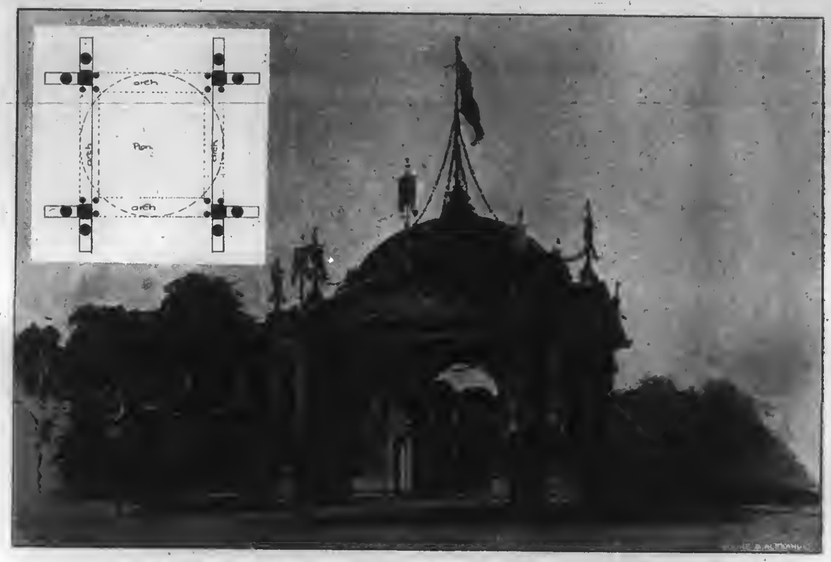

DESIGN BY H. SIMPSON, ARCHITECT, TORONTO—AWARDED SECOND POSITION.

DESIGN FOR THE DECORATION OF
UNIVERSITY AVENUE FOR
THE CANADIAN MANUFACTURERS ASSOCIATION
TORONTO ONT.
DETAIL SHEET.
SCALE [illegible] FEET.
W.P. WITTON.
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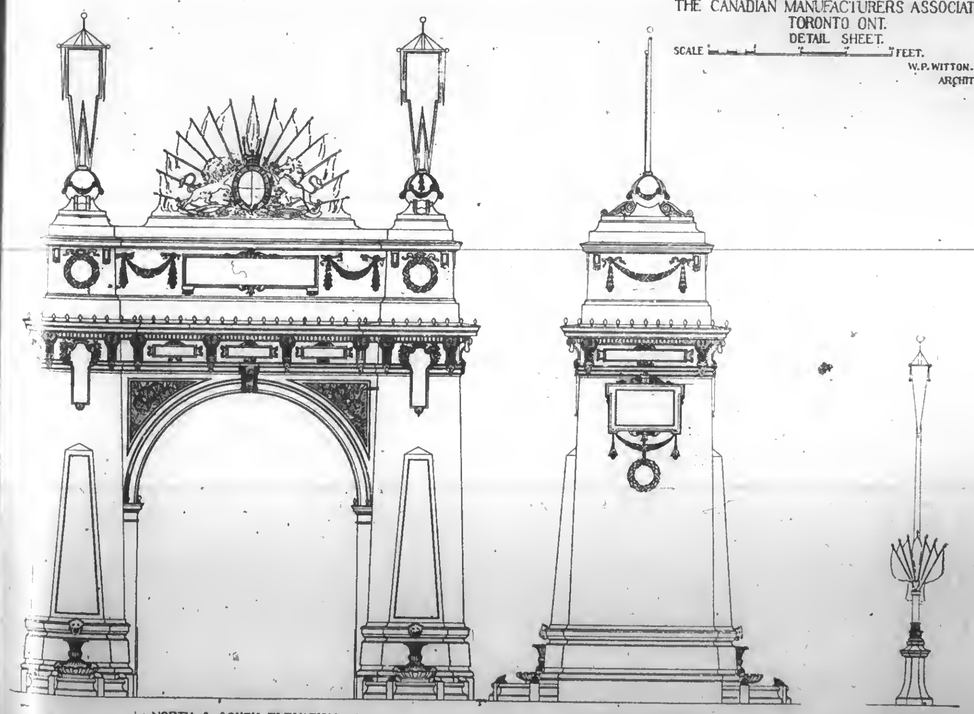

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SIDE ELEVATIONS.

DETAIL OF MASTS.

DESIGN BY W. P. WITTON, ARCHITECT, HAMILTON—AWARDED THIRD POSITION.

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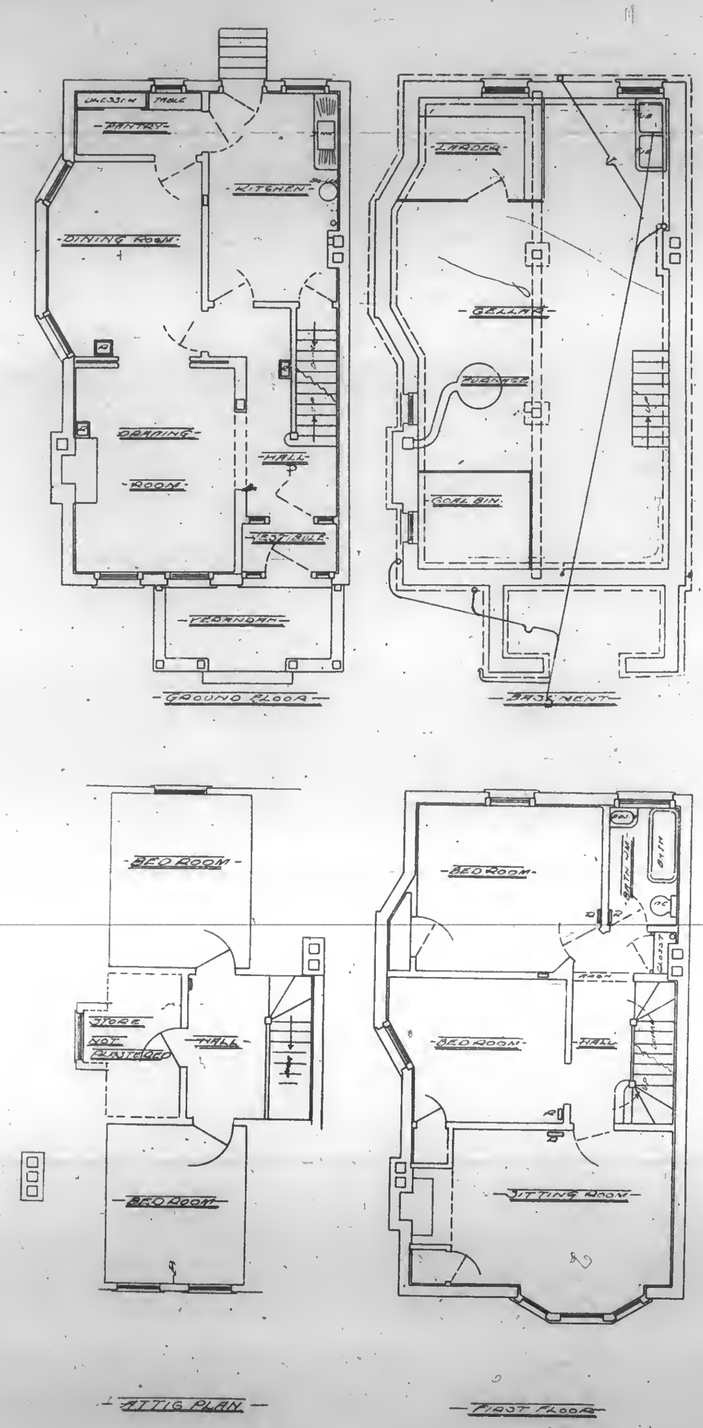

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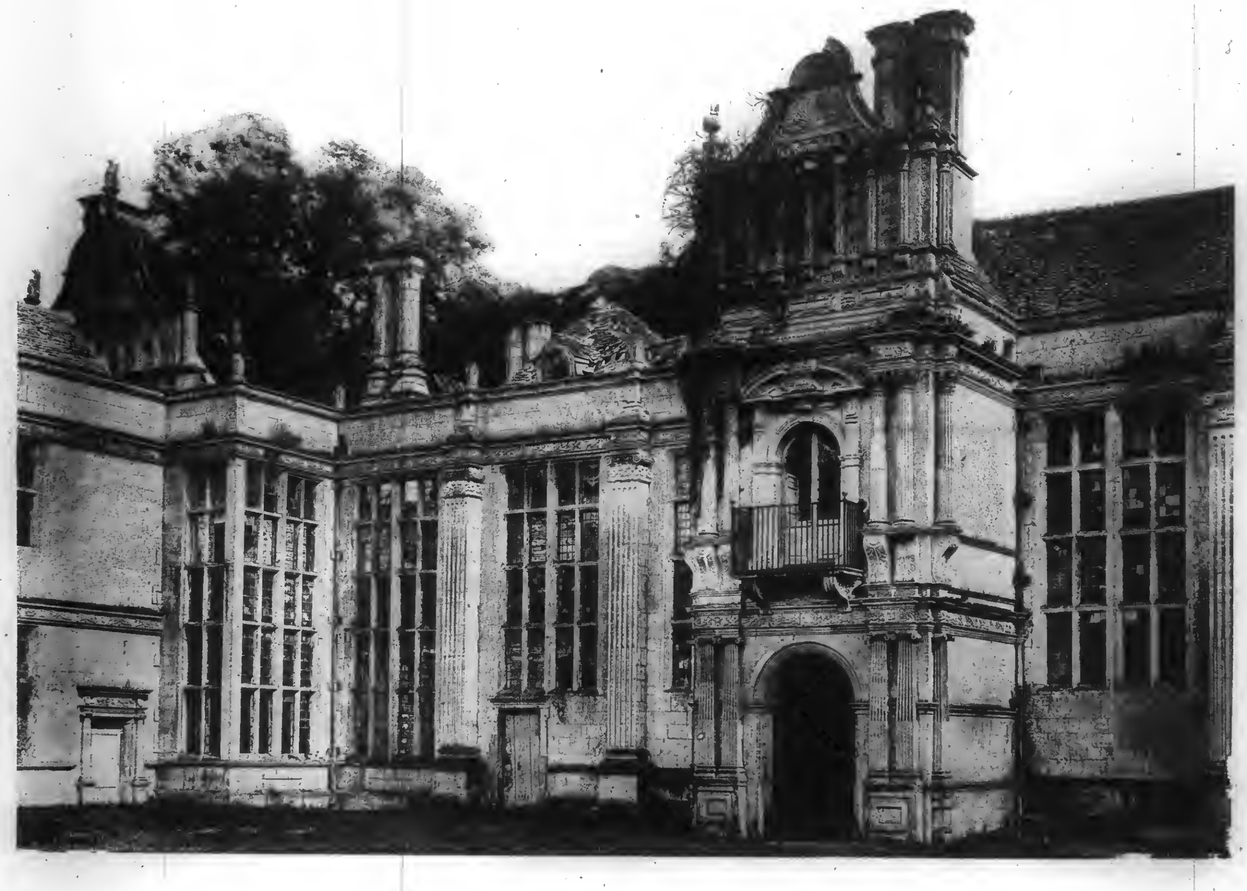

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The Canadian Architect and Builder

VOL. XIV.—No. 165. SEPTEMBER, 1901.

ILLUSTRATIONS ON SHEET.

"Standish Hall, Residence of Mr. E. B. Eddy, Hull, Que.—Messrs. Band, Burritt & Meredith, Architects.
Residence No. 13, Maple Avenue, Toronto.—Mr. F. S. Baker, F. R. I. B. A., Architect.

ILLUSTRATIONS IN TEXT.

The Canadian Pavilion at the Pan-American Exhibition.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Two Photogravure Plates.—Fine Art Galleries, Glasgow.

CONTENTS

Editorial	157-58	A Central Square for Toronto	164-65
The Development of Muskoka—and a Precaution	158-59	The Art Exhibit at the Pan-American Exposition	165
Insurance Rates in Relation to Risk	159	Cheap Hardware	165-66
Measuring Round Timber	159	Toronto Architectural Eighteen Club	166
By the Way	160	Test of a Fire-proof Floor	166
Inducements to Fire-Proof Construction	160	Ontario Association of Architects	166
The Protection of Buildings from Lightning	160-61	Architects at Cricket	166
St. Paul's Cathedral in Danger	161	Toronto Industrial Exhibition Notes	167
Building Materials and Clay Products	162	Student's Department	168
Architecture and Engineering at McGill	163-64	The Toronto Engineers' Club	VIII.
Licensing of Architects in California	164		

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MR. W. A. LANGTON, Architect, Toronto.
" EDMUND BURKE, " "
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A Commendable Idea.

The women's patriotic organization known as the Daughters of the Empire is to be commended for its wisdom in deciding to erect a permanent memorial of the approaching visit of the Duke of York. It was at first proposed to erect a temporary floral arch, but wiser councils prevailed, and the intention now is to construct a permanent gateway at the Bloor street entrance to Queen's Park. This gateway will consist of stone pillars in combination with wrought iron work of suitable design. This method of procedure is preferable to that of the manufacturers who are expending a considerable sum on a temporary structure which will disappear immediately after the royal visit.

Effect of Prices of Materials on Building.

ENQUIRY among architects goes to show that while the present building season has been an active one and on the whole satisfactory, many projects have been abandoned temporarily at least on account of the high price of lumber and some other materials which enter largely into construction work. Persons who contemplate building frequently forget that the present is a period of high prices for all other materials as well as those employed in building. It is scarcely possible to purchase an article of any description to-day as cheaply as five years ago. Why then expect to get buildings put up as cheaply now as then? The advance in prices is due to a strengthened demand, or in other words to increased prosperity. Vastly more money is being made by all classes this year than five years ago, hence the purchasing power is increased. Most persons contemplating the erection of buildings can well afford to pay say 20 per cent. more for their structures than would have sufficed for their erection in the times of depression. In many localities land values have gone up to an extent sufficient to offset the extra cost of building. So far as lumber, the staple building material, is concerned, the supply is rapidly decreasing every year, and higher prices must therefore be expected to rule for the future. No doubt when landowners shall have become thoroughly seized of the above mentioned facts, they will see the unwisdom of pursuing a policy of delay in the carrying out of their projects.

The Toronto Industrial Exhibition.

Notwithstanding the counter attraction offered by the Pan-American Exhibition, the number of exhibits at the Toronto Industrial Exhibition was as numerous as in former years. In live stock the exhibits were considerably greater, and the stable accommodation proved inadequate. The conclusion seems justified that the success achieved this year under adverse circumstances, might be greatly amplified if the Main Building and several of the other important ones, were replaced by modern structures designed to fulfil in a more perfect manner the requirements of exhibitors. That there is need for reform in the management is shown by the fact that after the opening of the Exhibition this year the roof of the Main Building leaked like a sieve. In consequence many of the exhibits were seriously damaged. The management should have known that the roof was defective, and the necessary repairs should have been made before the Exhibition opened. It would be unwise, however, to spend any considerable sum for repairs as the building is no longer capable of fulfilling the requirements. The support that has been given the Exhibition in spite of its many defects, is a guaran-

tee that if properly managed it will develop into an enterprise of vastly greater importance in the future. There were to be seen this year a number of exhibits from the United States in addition to those of Canada, a proof that the value of the Exhibition as a means of advertising is becoming more widely recognized. The presence of these foreign exhibits side by side with those of our own country, affords opportunity to make comparison between the quality of home and foreign productions. As a rule the result is a higher appreciation of the home article.

An Important Decision.

On the 22nd of July the House of Lords gave an important decision in the case of the Amalgamated Society of Railway Servants vs. The Taff Vale Railway Company, namely, that a Trade Union registered under the Trade Unions Act can be sued in its registered name, and the funds of the Union made available for payment of costs and damages where injuries have been inflicted by its authority. The action was based upon illegal acts, namely, watching and besetting, committed by authority and direction of the executive officers of the Union in connection with the strike of employees on the Taff Vale Railway. This judgment of the House of Lords is in reversal of the judgment of the Court of Appeal which held that the language of the statutes was not sufficient to warrant trade unions being sued for damages. The first decision was rendered by Mr. Justice Farwell, whose judgment has now been confirmed by the highest tribunal, and who in giving judgment said: "The contention of the defendant society implies that the Legislature has authorized the creation of numerous bodies of men capable of owning great wealth and of acting by agents with absolutely no responsibility for the wrongs they may do to other people by the use of that wealth and the employment of those agents." Lord Macnaghten in his judgment said: "I have no doubt whatever that a trade union, whether registered or unregistered, may be sued in a representative action if the persons selected as defendants be persons who from their position may be taken fairly to represent the body." It therefore appears that a registered Union may be sued in its registered name, and an unregistered Union through its proper officers. That the accumulated funds of the Unions can now be legally reached by persons and corporations who may have suffered damage by interference with their employees, will have a wholesome effect in keeping the agitators from continuing the methods of interference and persecution which have so frequently been practised in the past because they were exempt from legal process.

THE DEVELOPMENT OF MUSKOKA—AND A PRECAUTION.

The erection of the Royal Muskoka Hotel has brought luxury to Muskoka at last, and has probably broken ground for a new order of things. Hitherto Muskoka has been the poor man's paradise; there he could live in a hotel with board partitions between the rooms; sleep on a clanging spring bed, which substitutes sagging for softness; and eat food in which he could feel the modified enjoyment which comes from the conviction that it will be cheap. The new hotel is of a different kind. It is a well planned structure; spacious and, in a simple way, elegant; and aims at that degree of comfort which is indicated by the presence of the colored waiter. It is said that other hotels of the same sort are intended to be erected. We may therefore look for a change in the character of Muskoka. As surely as bad coin drives out the good so surely does the introduction of luxury strike at the existence of simplicity. We may look for improved buildings as a first symptom; a demand for wooden buildings with some design about them. This is an interesting class of work which returns better results for the amount expended than any other sort of building, if it is carried out with due appreciation of the merits of the material. We may however, look for the usual outbreak in the direction of imitation. Whether it takes the direction of castles and baronial halls, or a romance of humility and imitation log cabins, there are examples to start from, and even text books for the rapid worker. We can only look on helpless, and to some extent hopeless awaiting these developments in design. But there ought to be no doubt about the question of sanitation. The Muskoka Club ought to embrace, as a matter of necessity, all dwellers in the Muskoka Lakes; and should establish a rule, based upon the best science it can command, fixing a standard method of drainage from which there may be no departure. The foundation of life in Muskoka is the purity of the water; and this is assailed by the introduction of the sort of luxury that boasts, as this new hotel does, of its water service and drainage. It is popular to speak of Muskoka as a sort of Venice in the future; but there is this essential difference between the islands of Venice and the islands of Muskoka that in the former case there is an eighteen inch tide which twice a day sweeps all the city refuse out to sea, and though the process is not always complete and there are complaints about the smells of Venice, makes the place on the whole clean and sanitary. With the land-locked lakes of Muskoka, though they are deep, the case would be otherwise. Nearly every island is occupied now, and many points. Hotels are on the increase, and the exactions of competition soon require all hotels to be on a "modern" basis as regards drainage. Many cottages will without doubt follow suit, and the case will then be dangerous. The new hotel claims consideration on account of its "septic tank," through which all wastes must pass before they are delivered to the water—and perhaps this is sufficient. But it is impossible to feel the same delight in the purity of water into which the wastes of a populous hotel have been poured, no matter how scientific the sound of the process to which they have been exposed. Moreover, if the process is one which requires attention—knowing the unresting energy of nature and the laziness of man, we doubt.

It is not so much a question of the present case, where we may assume good management, as of the inferior class of hotel, upon which a system of drainage will be forced by the necessity of competition. Above all, when it comes to be a question of the insufficient labour (and often the volunteer labour) of a summer cottage, there is no certainty about the operation of anything that requires care. The only safety is in a rule absolute, that no drainage of any kind shall enter the water. The land is the place for drainage. The thousands of Israel lived in safety in their encampments, under the simple rule that every man should ease himself at a place without the camp, and take a paddle with him, to dig there and cover that which had come from him. The method of subsoil irrigation, to which this may be compared, should be adopted where there is a sufficient surface of turf near by, as there is at the new hotel, and as there is likely to be near any good hotel site; but Muskoka consists for the most part of an irregular rocky surface and the only method possible in ordinary cases will be simply to deliver the drainage over the surface. This method also has been put to proof by a nation. China, densely inhabited in parts, supports a people, with the strongest constitutions in the world, under a system of disposal of wastes upon the surface of the fields that is said to make it impossible for an Englishman to take a walk across the country, because of the filth which sticks to his trousers. The Chinese method is not commendable otherwise than as evidence that the surface of the earth is a safe place for the disposal of sewage products; or rather we should call them wastes, for they are not degraded to the quality of sewerage until they have been in a sewer. It is extremely probable that under any other system the land of China would not support its population and the yellow terror would have been upon us long ago. The land of Muskoka will not support its population now; but that even these rocks are capable of improvement is evidenced by the fact that earthworms (once undiscoverable in Muskoka) are to be found, fine and large, near the privies of the old Muskoka cottages. These old receptables are not models for the future by any means and, for a hotel are certainly impossible. The stuff must be conveyed by water to a suitable place and spread over the land; just as the saw-millers, when they were forbidden to throw their saw-dust into the water, pumped it up to the conduits, which carried it inland to convenient places. There is in the interior of most islands an unvisited area. If not it would be necessary to make such an area and prepare it for use. If there is a fall from the site of the house to this spot, the problem is easy; if not there must be an arrangement for pumping at intervals. For this purpose the windmill—which, with a tank, will be an indispensable adjunct for water service—could be utilized. There is no reason to suppose difficulty about contrivances, if the system is made compulsory; and, though this may be difficult, it ought not to be impossible, because it is necessary.

These remarks are suggested as applicable to Muskoka chiefly on account of the progress in that particular region which the establishment of the hotel indicates; but the situation tends to become the same in any of our small lakes which have become devoted to the uses of the summer cottager; and in all of these places consideration for the future, in the matter of drainage, becomes necessary as the population grows thick.

Acetylene Gas.

Here is a convenience which is making its way for use in both summer cottages and permanent country houses. It costs less than fifty dollars to install both piping and apparatus for an ordinary house, and the running cost is said to be about the same as that of coal oil. At this rate it has the advantage that experiment does not involve a paralyzing expense, and we may feel at liberty to suggest its application to country work, without having any knowledge from experience of the quality of the light. It seems to be a pleasant and steady light and has the advantage that, as the flame is very small, it does not easily flicker in the air. The light is therefore well adapted for out of doors use, for verandahs and to light paths and boat landings. There are many contrivances for the generation of the gas. The contact of water and calcium carbide is all that is necessary, and the aim of the best contrivances seems to be to generate gas only as it is needed. The release of pressure by turning a tap brings in some cases water to the carbide, in others carbide to the water, just in proportion as it is needed; that is to say in proportion to the release of pressure, or to the taps turned on. This facility of application in quantities as needed seems to tend not only to economy but to safety. There is a residuum of slaked lime which requires to be drawn off two or three times a week; an accumulation of a few buckets which may perhaps be made useful.

INSURANCE RATES IN RELATION TO RISK.

The Maritime Board of Trade is an organization which represents the local boards of trade in the principal towns of New Brunswick and Nova Scotia, and is an exceedingly enterprising body. The board meets once a year and discusses a variety of questions affecting the commercial interests of the maritime provinces. At the seventh annual convention held in Chatham, N. B., on August 21st and 22nd last, a number of important subjects were considered. Among these was the question of fire insurance rates. This was taken up in view of the reported intention of the insurance companies to increase the rates. The testimony of the representatives who spoke on the question went to show that the insurance rate was not governed as largely as it should be by the character of the risk. One speaker remarked that twenty years ago before the advent of electric lights and fire extinguishing appliances, when stores were lighted by oil lamps and stove-pipes were everywhere, the insurance rates were 100 per cent lower than they are to-day. It was stated that in Charlottetown the promise was made that the rates would be reduced as soon as a good water works system was installed, but that this promise had not been fulfilled, on the contrary the rate had been increased. It was said that with the exception of a few large conflagrations, the fire loss in the maritime provinces had been considerably less than in other parts of the Dominion, and the opinion was expressed that the people of these provinces were being called upon to pay for losses elsewhere. A resolution was adopted protesting against any increase in the rates, and declaring that in the event of an increase being imposed, a united effort be made to induce American and other companies to accept the business. It was also resolved that the insurance companies be requested to separate the maritime provinces in their insurance calculations from the rest of the Canadian business.

MEASURING ROUND TIMBER.

The usual practice, in measuring round tapering timber, is to take the girth of each piece at the middle of its length. A quarter of the girth is then squared in inches, and multiplied by the number of feet run in the log, the resulting figures being divided by 14, which gives the answer in cubic feet. A tape measure, known as girthing tape, is often used by timber measurers. It is 12 ft. long, marked with ordinary inches along one side, and also with feet reduced with scale—1 in. = 1 ft.—showing the cubical contents of 1 ft. on the back of the tape behind each figure.

BY THE WAY.

The firm hold that electric lighting has obtained on public favor is exemplified by the fact that in a number of the new dwellings now being built in Rosedale and other choice residential districts of Toronto, no gas piping for lighting purposes is being put in. A single gas pipe entering from the rear suffices to give the supply required for cooking purposes.

× × ×.

THE main building at the Toronto Exhibition which must shortly be replaced by a more modern structure, has had quite an interesting history. It was originally built in 1852 on King Street West on a site which is now included in the asylum farm. On the occasion of the visit of the Prince of Wales in 1860, a grand ball was given in his honor in this building. In 1878 it was taken down and rebuilt on its present site, another storey being added.

× × ×

A good story is told by an English trade journal of a master builder, who, having heard that the men did not start work at the proper time, thought he would drop down about half-past six one morning and see. Going up the yard he caught sight of a joiner standing smoking, with his kit not even opened. Simply asking his name, which he found to be Malcolm Campbell, he called him into the office, and handing him four days' pay, ordered him to leave at once. After seeing the man clear of the yard, he went up to the foreman and explained that he had made an example of Malcolm Campbell by paying him off for not starting at the proper hour. "Great Scot, sir!" ejaculated the foreman, "that chap was only lookin' for a job."

× × ×

IN 72 days the elevator in the tower of the new municipal buildings in Toronto, carried 39,833 persons to the top of the tower to see the great clock and obtain a bird's eye view of the city. As the elevator will accommodate but twelve persons, more than three thousand trips were required, and at times the corridors were lined with a crowd of people waiting their turn to make the ascent. No doubt there were thousands of visitors to the building who did not visit the tower. It will thus be seen what a point of attraction the new city buildings have already become to strangers visiting the city, of whom the number steadily increases each year. It is desirable that the building on the erection of which so much money has been expended, should be made increasingly interesting as time goes on by the addition of mural decorations, paintings and sculpture.

INDUCEMENTS TO FIRE PROOF CONSTRUCTION.

A correspondent sends the following extract from the New York Insurance Exchange Schedule, relating to fire-proof buildings:—

"EXCEPTIONAL CONSTRUCTION.—For fire-proof floor surfaces of cement, concrete or asphalt, deduct 5 per cent. If floors inclined for carrying off water with scuppers, deduct 2 per cent. Fire-proof woodwork, trim, etc., deduct 5 per cent."

"If the same reduction was made in Canada as the above," says this correspondent, "it would induce people building to take advantage of the insurance reduction and use fire-proof materials."

THE PROTECTION OF BUILDINGS FROM LIGHTNING.

A paper on this subject recently read by Mr. Alfred Hands, before the London Architectural Association, concludes as follows:—

As to the methods for rendering our system of protection perfect. We must first of all decide on which are the parts of the building liable to be struck by lightning, and protect them either by separate conductors or by branch conductors carried to one or more mains to earth as may be necessary, and we must see that these conductors afford as little resistance as possible. The joints must be soldered so that they will not only be perfect at the time they are put up, but will remain perfect. The earth connections must also be made so that this path is at least as good a one as other paths about the building; and besides this we must carefully study our building, both inside and out. We must take into consideration all the metals used in its construction, both as regards their relation to the conductor system and to one another, and take such precautions that neither division of the discharge shall occur unless we intend it to occur, nor sparking in places where sparking would do harm. It is here that the skill and experience of the expert have to be displayed, and I cannot give you any rules for your guidance on this matter, for buildings differ so much in their construction and arrangement that rules appliable to one case would be absolutely useless for another. Nothing is of use but knowledge and experience, and, as I have already indicated, these cannot be imparted or acquired in a short space of time. I can only say that in some cases connections are made and in others the dangerous metals are avoided, but that great discrimination is required as to what metals are connected and what avoided. Sometimes dividing the discharge between several paths or over a wide extent is the best plan, and sometimes other plans are adopted according to the exigencies of the case or the particular combination of dangers which one may find to exist.

I may, in conclusion, discuss a matter which is of great importance to architects, and that is as to what parts of a building are liable to be struck, and which, therefore, require protection. I have devoted many years to this question, and have examined many thousands of buildings which have been struck, first, with the object of formulating a theory, and afterwards to prove that theory; and I propose putting this before you as briefly as possible. The main principles are simple, and possibly it is the very simplicity of the matter which has led to its being overlooked. The popular idea is that it is the highest point of a building which is struck, but probably some of you may have met with cases in which others very much lower down have been damaged. I have come across hundreds such. The explanation is that the nearest part of the building to what I may call the point in the cloud from which the discharge originates gets struck, and the highest is not necessarily the nearest. A discharge occurs between two planes or points, one of which is in the clouds and the other is in the ground; the building is merely an object en route, as one might say, which forms a path of less resistance than the surrounding air. Now, a lightning-conductor does not attract lightning except as, being of metal, induction and consequent difference of potential takes place more strongly in it than in the surronnding non-conducting materials, and in this respect the thin line which is intended to protect the building from lightning is insignificant compared to the other metals used in its construction.

Brickwork, although non-conducting to a certain extent, offers a lower resistance than air. Therefore it would be contrary to science for a discharge to pass over a chimney-stack or gable-end to strike a lightning conductor merely because it is metal, when probably the gable-end or chimney has a much larger extent of metal just below it. Even if the lightning-conductor affords the best path to earth, the path of least resistance would be through the gable-end or chimney and the house to the conductor, rather than through a corresponding distance of air, to get to the top of the conductor. We have to consider two kinds of discharge, one the most dangerous type, which occurs fairly straight through the air in an almost vertical line, and the less dangerous flashes which occur in a somewhat oblique line, and are generally meandering in their course. These latter flashes are often called forked lightning, though this is a misnomer, and are popularly, but mistakenly, supposed to be the most dangerous. It is the straighter flashes which do the most harm; those which are capable of breaking almost straight through the air without having to go out of their course to take advantage of any little conducting matter, such as moisture, which will assist them on the way. The meandering flashes are not by any means to be ignored; it is only in comparison with the straighter ones that they are mild.

In arranging what parts of a building require protection, we have to consider the various points in the sky from which the discharge may originate, and so arrange our system that the conductor, or one of its branches, will form the nearest part, no matter from what direction the discharge may come. There is, of course, a limit, to the angle of obliquity, and this limit should be about 40 degs., and my observations have led me to infer that the greater the angle of obliquity the milder the discharge. We hear reports sometimes of buildings having been struck by lightning in absolutely unaccountable places, such as lightning missing a tall spire and striking the nave close underneath it, or even striking through a window. Like all other so-called vagaries, freaks, or perversity of lightniug, such peculiarities do not exist except in the minds of people who do not understand the matter. Lightning is a force of nature, and, like all other natural forces, is governed and regulated by laws more unchangeable than those of the Medes and Persians; therefore, if we find cases which do not quite agree with our preconceived ideas, we must admit that we either do not know the law, or that we have overlooked some important factor of the case, and not put it down to a sudden and capricious change in the laws of nature.

In arranging as to which parts to protect, we can consider this question as to which would be the nearest part, and we can take it that these are parts which might be struck; other parts higher than these may be absolutely safe if they come well within a line drawn from one to the other, provided other circumstances are equal; but they may not be, for metals either inside or outside the building, and other circumstances, may complicate the question so far that this rule does not entirely apply. Notwithstanding all the difficulties that I have pointed out, absolute protection is possible if the building is thoroughly studied. We can either protect it so that we can say not a brick or stone shall be disturbed, or we may say we will protect it so that the inmates shall be safe and the building shall not be set on fire or damaged to any extent—we may say that a stone finial at this end may be knocked down, or a few bricks or tiles disturbed there, and that we will risk that, as we do not consider this damage worth providing against; but if we do this we must realize that we are running the risk, and if the stone finial is thrown down, or the bricks or tiles displaced, we must consider that we deliberately took the risk, and that it is not a failure of our system of protection.

In conclusion, I can only advise you not to make the general error of providing your conductors of exceptionally large size under the mistaken idea that by providing your conducting path of exceptional capacity, as it is wrongly called, you can ignore the scientific aspect of the question, for no increase in size of the conductor will compensate for this.

ST. PAUL'S CATHEDRAL IN DANGER.

As the result of rumors which have lately been in circulation regarding the stability of St. Paul's Cathedral, Mr. Somers Clarke, the architect to the Dean and Chapter, has addressed a communication to the Times, giving the results of his observations and examinations of the building. He states that owing to the expense involved, the foundations of the cathedral were not carried down to the bed of hard clay, 40 feet below the ground surface, but were spread out as much as possible and made to rest on a layer of "pot earth" over a bed of sand and shingle above the clay. The numerous tunnels which have since been made for sewers and underground railways, have caused uneven settlement of the foundations, dislocation of the arches of nave, choir and transept, and subsidence of the west front with its heavy towers and bells. The outer wall of southern transept, which is between 8 and 10 feet thick, and has an outer face of Portland stone with a lining of Oxfordshire stone, is out of perpendicular, and in consequence of the strain it has opened from east to west. The north side of the cathedral is, however, perfectly solid. Upwards of one hundred years ago the building was strengthened by the insertion of iron ties and the dome encircled by great iron chains. It is now proposed to insert iron ties in the transept walls. Another method proposed by Mr. Charles Reilly, is to carry the piers down to the sub-stratum of blue clay. The cost of underpinning is estimated at £220,000. This architect recently strengthened the Stock Exchange by underpinning to a depth of 50 feet the isolated stone piers which support the building, each of which weighs 300 tons. This was accomplished without cracking the plastering in the interior of the building.

NOTE.

As a result of the recent decision of the English House of Lords, holding the funds of labor unions liable for damage caused by the official action of the unions, the Taffvale Railroad Company has begun suit against the Amalgamated Society of Railway Servants for one hundred thousand dollars damages, incurred by the unlawful action of the Society during the strike of last year. The Blackburn branch of the Weavers', Winders' and Warpers' Association has also been served with papers in connection with a strike in a factory. The Trades-Union Congress has appointed a committee to endeavor to find some legal means of protecting the funds of unions from attack.

BUILDING MATERIALS AND CLAY PRODUCTS.

The report of the Ontario Bureau of Mines for 1901, gives the aggregate value of the building materials produced during the year 1900, including under this term stone, lime, common brick, pressed brick and terra cotta, as $2,689,351, compared with $2,621,282 in 1899, an increase of $67,069. An error crept into the statistics of building stone and rubble for 1899 by which the value of the product was given as $1,041,350 instead of $667,532. The comparative table for the last two years is as follows :

	1899.	1900.
Building stone, rubble, etc.	$ 667,532	$ 650,342
Lime	535,000	544,000
Common brick	1,313,750	1,379,590
Pressed brick and terra cotta	105,000	114,419
Totals	$2,621,282	$2,688,351

Judging from these figures says the report the building trade remained in a fairly active condition. Part of the increase is due to a rise in prices, the average cost of lime per bushel in 1900 being 13.9 cents as againt 12.3 cents 1899, and common brick being valued at 5.73 per thousand as against $5.61 in 1899. The output of other clay products for the two years compares as follows : drain tile, paving brick and sewer pipe showing a falling off which is more than made up by an increase in pottery.

	1899.	1900.
Drain tile	$ 240,246	$ 209,738
Paving brick	42,550	26,950
Sewer pipe	138,256	130,635
Pottery	101,000	157,449
Total	$ 522,152	$ 524,772

The manufacture of cement continues to expand, the total production of 1900 being much larger than in any previous year. The increase is wholly in Portland cement, the natural rock variety being smaller in output and value than in 1899. The raw materials for an excellent quality of Portland cement—marl and clay—being so abundant in Ontario and the demand for pavement and constuction purposes being so great and constant, there is every likelihood that the production will continue to increase. The number of cement works reporting to the Bureau last year was nine, of which four made natural or rock cement and five Portland cement. In addition to the factories now in operation, one or two others will place their product on the market during 1901. The detailed statistics for 1900 are as follows :

Kind of Cement.	Number of works.	Number of workmen.	Wages for labor.	Product bbls.	Value of product.
			$		$
Natural rock	4	90	32,760	125,428	99,994
Portland	5	485	166,143	306,726	598,021
Totals	9	575	198,903	432,154	698,015

There was an increase in the total quantity of cement produced in 1900 as compared with 1899 of 70,117 barrels and in value of product of $136,749. The average price at which the cement was reported to the Bureau was 79 cents per barrel for natural rock and $1.95 for Portland, as against 84 cents and $2.00 per barrel respectively in 1899. That the home market is not by any means wholly supplied by the product of Ontario works is proven by the fact that during the fiscal year ending June 30, 1900, the imports of cement into Canada amounted to 1,312,170 cwt. as follows:

	Value.
From Great Britain	$ 249,280
" United States	55,569
" Belgium	156,213
" Germany	59,331
" other countries	200
Total	$ 520,593

The duty paid on the importations was $151,075.06.

It is worthy of note that a marked change took place during the year in the proportion of cement imported from the several countries of origin. In the 12 months ending 30 June, 1899, the imports were :

	Value.
From Great Britain	$ 125,778
" United States	52,878
" Belgium	232,434
" Germany	73,135
" other countries	146
Total	$ 484,371

It will be seen that the imports of Belgian and German cement which had risen from $79,370 and $15,603 respectively in 1896 received a decided check, while those from Great Britain were almost doubled, and constituted even a larger proportion than in 1896 when they were $123,436 worth out of a total importation of $252,882. The preferential tariff, whatever may be its operation with respect to other articles, certainly seems to be effective with cement.

While the above statistics show that the importations of German and Belgian cements into Canada have largely decreased, and in like proportion those from Great Britain have increased. British statistics show that the product of continental factories, principally Belgian, is going into the British market at the rate of 270,000 tons per year, which is equal to ten per cent. of the production of the British factories. So that the gain that Great Britain is making in the Canadian market is being offset by the loss of home trade. The statement is made that the Belgian cement which is finding its way into the British market is not being sold at a loss, but owing to the excellent equipment and labor saving methods employed in factories where it is produced, it is bringing to the manufacturers a fair margin of profit. British manufacturers are in consequence being urged to modernize their works, thereby reducing the cost of production, and placing themselves in position to compete with the foreign material. Within the last five years the manufacture of Portland cement in the United States has been greatly extended and perfected, and the product of the mills across the border is this year being placed on the Canadian market in large quantities. Several new Canadian factories are ready to begin operations and others are projected, so that in the near future the capacity of the home mills will more nearly approach the requirements of this market. There is need for caution on the part of those who are thinking of engaging in the business, to see that the manufacturing capacity does not run in advance of demand. This has already happened in the United States, hence the eyes of manufacturers there are being turned to Canada and other foreign markets.

With a view of securing better sanitary regulations in municipalities where waterwork and sewerage systems exist, a resolution was passed by Dominion Trades and Labor Congress that the Executive of the Congress urge the Legislative Assemblies of the Provioces to amend the health act so as to compel such municipalities to appoint a competent plumbing inspector.

ARCHITECTURE AND ENGINEERING AT McGILL.

The accompanying illustrations will convey some idea of the character of the equipment at McGill University for the teaching of Architecture and Engineering. It will be seen that provision is made for the instruction of the students from both the artistic and practical sides. McGill owes to Mr. W. C. McDonald its magnificent building and equipment for engineering and architectural instruction, and is understood to be now on the look-out for a generous benefactor to bring the endowment for teaching purposes up to a standard in keeping with the building and equipment.

In the Department of Architecture, of which Professor S. H. Capper is the head, and Mr. H. F. Armstrong, lecturer, the equipment consists of a representative collection of casts of architectural detail and ornament and sculpture ; of photographs and illustrations; an arc-light electric lantern ; a large collection of slides, diagrams and models ; and a library for architectural study. The Architectural, Freehand Drawing and Modelling Classes are open to women students.

A Room in the Architectural Department.—McGill University.

The course in this department begins with the second year, the first year being preparatory. The work of the second year is of a general character, and is planned to combine to some extent the work of the Architectural and of the Civil Engineering students.

The third and fourth years are devoted to more specialized architectural study in various branches, and a fifth or graduate year has been organized for advanced study in design. For those students who desire to devote themselves more especially to the engineering side of architecture, the course is modified to include additional mathematics in the third year, and the advanced course of Theory of Structures in the fourth year. Such students devote proportionately less time to architectural drawing and designing.

In the second year the historical course embraces a rapid survey of Architectural History from ancient Egyptian to modern times. The great eras of European civilization are successively dealt with, and the evolution of styles is traced in their constructional and ornamental forms and methods.

In the third and fourth years the lectures are arranged in continuation and extension of this general course. Renaissance and Modern Architecture are studied in the third year ; while a course covering both third and fourth years comprises more detailed study of Ecclesiastical, Domestic and Public Architecture, and deals with the historic evolution of architectural styles and with the problems and requirements of modern work.

Instruction in drawing is given during all four years, Freehand Drawing (ornament and figure) from the cast and Architectural Drawing occupying much of the students' time during three years course. Modelling in clay is included in the third and fourth years.

Problems in Architectural Design form the basis of work in the Architectural Drawing class from the earliest available period, being at first more especially combined with the study of the Classical Orders.

A course of lectures is included upon General Art History, so as to place the architectural student in touch, not only with the decorative details of the different architectural styles, but also with contemporary forms in other branches of art, especially the decorative arts employed in building.

For the scientific side of professional study the courses in Mathematics are very fully developed in the first and second years, being continued in the third year also by those who elect to take the advanced course in Theory of Structures. Descriptive Geometry is studied, as well as elementary Shades and Shadows and Perspective. A course in Surveying, both practical and theoretical, is also included ; and a short course in Geology is given in the fourth year.

Theory of Structures and Strength of Materials form one of the chief subjects of study in the third year, the course also comprising instruction in Graphic Statics as well as supplementary work of a practical nature in the Testing Laboratories.

A full course on Building Construction and Architectural Engineering has been organized for the third and fourth years, common to both architectural and engineering students. It includes also sanitation and Hygiene, Heating and Ventilation; Specifications and Professional Practice.

During the Session 1900-1901 a special course of lectures was arranged to be available for those who are engaged in office work during the day; it embraced the subject of Architectural Styles, their Features, Mouldings and Ornament. This course was planned with a view to preparation for the examinations for Associateship now held in colonial centres by the Royal Institute of British Architects; it comprised a detailed study of the three great divisions of historical architecture, Classical, Mediaeval and Renaissance, in accordance with the examination-programme of the Royal Institute.

The course will be repeated in session 1901-1902, if sufficient students come forward.

Carpenter Shop.—McGill University.

In the Drawing Rooms.McGill University.

LICENSING OF ARCHITECTS IN CALIFORNIA.

The new California law requiring architects to secure certificates in order to practice in that state is about to go into effect. All architects not having sent in their applications for certificates to practice architecture and approved previous to September 23, will be barred from receiving a certificate and will be required to pass an examination.

The subjects upon which the applicants for a certificate of competency to practice architecture, shall be examined are as follows:

Demonstration of ability to make practical application of knowledge in the ordinary professional work of an architect, as follows: 1, merit as investment; 2, planning; 3, construction; 4, design; 5, rendering.

Materials and construction of buildings, eleven subjects as follows: Foundations, concrete work, stone masonry, mortar, brick masonry, structural iron and steel work, carpentry, joinery, sheet metal work, plastering, painting.

Strength of materials, eight subjects, as follows: Tension, compression, shearing, transverse strain, structural columns, floor beams, girders, trusses.

Sanitation, three subjects, as follows: Plumbing, heating, ventilation.

Electrical construction as applied to buildings.

Supervision of all the foregoing subjects as applied to buildings.

Each subject of each sub-division shall be graded by the committee on examination, and the applicant whose grading shall be 75 per cent. or over, shall be entitled to a certificate of competency.

A penalty of not less than $50 nor more than $500 will be inflicted on persons practising architecture without having obtained a certificate.

All plans issued from the office of a certificated architect must be impressed with a seal having his name and place of business and the word, "certificated architect."

A CENTRAL SQUARE FOR TORONTO.

The Board of Control of the Toronto city council has declined to lease the land opposite the city hall for the purpose of a public square on the terms offered by the owners. The portion of land offered, 130x107 feet, is too small. If the whole of the land from Bay to James street cannot be secured on satisfactory terms, the project might as well be abandoned. A less area would not answer the end in view, which is to provide a public square within the business district and improve the surroundings of the new city buildings. The city has the right to expropriate the land, but this would probably involve costly arbitration proceedings. It is to be hoped that a way may yet be found to accomplish this much needed improvement.

THE ART EXHIBIT AT THE PAN-AMERICAN EXPOSITION.

"Canadian artists will have to wake up" said a well-known Toronto artist the other day on his return from an inspection of the art exhibit at the Pan-American Exhibition. "They are too much given to thinking that they know it all and that there is nothing good outside a particular school. The Canadian art exhibit at Buffalo is perhaps up to the standard of the average work shown there, but is certainly far below the best work exhibited. The art exhibit as a whole is representative of all schools and contains work of equal merit in the broad style of treatment as well as in a style almost as refined as that required for miniature portraits. There are to be seen a number of pictures which are of the highest excellence. It is noteworthy that in the United States painting in oils is taking the lead, the demand for water colors having greatly diminished of late. The artist in oils works with greater certainty of securing the effect desired than is possible with water colors. Referring again to the Canadian exhibit, the space allotted for this exhibit was only 150 square feet but this was doubled later on after the exhibit had been arranged for, consequently the Committee were compelled to get together from different sources and on short notice sufficient pictures to fill the additional space. On this account the selection could not be as carefully made as was desirable."

Canadian Pavilion at Pan-American Exhibition.

A receipt for waterproofing blue prints runs as follows:—Immerse in melted paraffin until saturated a number of pieces of an absorbent cloth. When these are withdrawn and cooled they are ready for use at any time. To apply to a blue print, spread one of the saturated cloths on a smooth surface, place the dry print on it with a second waxed cloth on the top, and iron with a moderately warm iron. The paper aborbs paraffin until saturated, and becomes translucent and highly waterproof. The lines of the print are intensified by the process, and there is no shrinking or distortion.

CHEAP HARDWARE.

Suitable and appropriate trimming is something that is too olten slighted both by owner and architect, and the tendency to cheapen the entire contract by reducing the cost of the hardware is daily evidenced by the appearance of some of our buildings, says a writer in the Architects' and Builders' Journal. As a rule the hardware is a neglected matter until the building is nearly completed, and then as an offset to the expenditure in other details, the allowance for this is cut down.

The result is what one would look for in such a case. A handsome house or apartment with everything of an elegant appearance, the floors tiled, the walls beautifully frescoed and the woodwork handsomely polished, while the hardware throughout is of the cheapest class, not fit for a tenement. There is an abundance of such hardware on the market. Take in the first place the front door which is at all times before the eyes of the public. If trimmed artistically, it at once makes a good impression, and to be artistic does not necessarily mean at the same time expensive, for a good lock that is reliable can be had at a very reasonable figure, and a plain grille will pay for itself in effect. Ornamental hinge straps will also add wonderfully to the appearance of a house, while on the other hand a cheap lock and trimmings will cheapen a door no matter how handsome it may be. A door cheaply trimmed makes the same impression as a soiled shirt front on a person, both are criterions by which you may judge of the rest of the make-up.

Locks for interior doors need not be either elaborate or intricate, but should be in keeping with the other appointments. If an ornamental design is too costly, then plain trimmings is in good taste, and, like black clothes, always in keeping. When the cheap ornament designs have the word "cheap" woven in the pattern, the owner makes a sad mistake in using them. The public notices and is influenced by such apparently little things. Plain bronze hardware is but very little more expensive than the cheap trade ornamental goods and its application shows better taste.

Then again the utter disregard of the general architecture of the building in applying trimmings is a very common mistake. The effect of an elegantly carved door of Romanesque style trimmed with colonial hardware is not only an example of bad taste, but is a mistake that means a money loss, as a tenant may not be artistically educated, still a feeling of inconsistency will be experienced, for no person is so constructed that discord will not affect him to a greater or less degree.

No clause in the contract is so much neglected and none of more importance than the one relating to hardware. In the matter of butts there are many varieties from which selections might be made, but experience and judgment should be brought to bear in this matter. Bronze iron butts for the purpose of hanging the door do the work as well as the more expensive solid bronze, but they will not remain but a very short time. The appearance of the iron on a

hardwood door where the lock trim is bronze certainly is not pleasing. Then again the mistake of cheapening the trimming by using a light butt is a serious one.

Nothing can be more provoking than a door that drags in closing or that will not close at all. While a settling in the building affects this matter more or less, it is more often the case of the butt being too light or too small, so that the weight of the door causes a sag that the butt will not withstand. A loose joint butt is a little less expensive than the loose pin, but it is not so durable nor convenient, as in a loose joint there is one bearing, and consequently more tendency to give and wear, thereby causing the same trouble as in the case of using a light butt. A loose pin has three bearings, and in case of necessity to remove the door it is much easier to do so.

A conspicuous fault in the present cheap trimmings of apartment houses and residences is the fact that the keys are interchangeable, or, in other words, the key that opens the hall door is more than likely to operate the lock on the pantry door or the linen closet and vice versa. This may be overcome by specifying in the contract that the locks have two or more tumbles and all be different.

The tendency to use cheap hardware seems to prevail more with the owner than the architect. In a great many cases the owner is not a man competent to select good trimmings for his house, and therefore should turn it over to the architect, who will select something in keeping with the house for which he has drawn plans.

TORONTO ARCHITECTURAL EIGHTEEN CLUB.

The Annual Meeting of the Toronto Architectural Eighteen Club was held on the 23rd inst., when the following officers were elected for the ensuing year: Mr. Eden Smith, president; Mr. C. H. Acton Bond, 1st vice-president; Mr. J. C. B. Horwood, 2nd vice-president; Mr. C. D. Lennox, 3rd vice-president; Mr. J. P. Hynes, secretary-treasurer. A discussion took place on the subject of architectural education and the improvement of the Toronto Industrial Exhibition. A special meeting of the Club has been called for the 30th inst. to further consider these matters.

TEST OF A FIREPROOF FLOOR.

A test was recently made in the presence of the architects of the building, the assistant city engineer, and others, of an expanded metal floor, constructed by the Expanded Metal and Fireproofing Company, Limited, in the new St. Lawrence market building, Toronto. A weight of over 20,000 lbs. was placed on an area 12 feet x 4 feet, or to figure it out as a distributed load, about 420 lbs. per square foot of area. This load, which was up to the limit of the strength of the girders, was carried without sign of failure, and was considered entirely satisfactory. This building has nearly 50,000 feet of unbroken fire proof floor area.

ONTARIO ASSOCIATION OF ARCHITECTS.

The attendance at the weekly luncheons, which have been maintained without interruption during the summer, is now steadily improving. These luncheons are a popular feature, affording opportunity for frequeut social intercouse as well as the discussion of matters of interest to the profession.

Request has been made by the Toronto Architectural Sketch Club to be granted the use of the Association rooms in which to hold their Saturday evening meetings. It is understood that the Association is willing to comply.

ARCHITECTS AT CRICKET.

An interesting cricket match was played recently at the Woodbine by teams representing the Ontario Association of Architects' and the Toronto Architectural Eighteen Club. The Association won by 70 runs, the following being the scores:—

Eighteen Club—1st Innings,

E. Rolph, run out	0
A. H. Smith, b Siddall	2
W. Rae, b Pearson	1
J. F. Brown, b Siddall	4
S. Smith, b Pearson	0
C. H. A. Bond, not out	2
C. Lennox, c Gouinlock, b Siddall	0
J. C. Horwood, b P arson	0
Smith, run out	0
Extras	1
Total	10

Eighteen Club.—2nd Innings.

C. H. A. Bond, c Over, b Baker	2
Hynes, c and b Pearson	2
E. Rolph, b Baker	0
Rae, not out	8
Brown, b Pearson	10
Smith, c Siddall, b Baker	0
C. Lennox, run out	0
Horwood, c Pearson, b Langton	0
Smith, b Lang on	4
Total	26

O. A. A.

A. R. Denison, c Horwood, b Brown	0
P. Over, run out	59
J. W. Siddall, b Brown	0
W. A. Langton, c Horwood, b Smith	18
J. A. Pearson, c and b Smith	4
G. W. Gouinlock, not out	11
F. S. Baker, b Brown	6
A H. Gregg, b Smith	0
Saunders, b Brown	0
Extras	10
Total	106

The bowling of Pearson, Siddall, Baker and Langton for the Association, and the wicket keeping of Rolph and fielding of Howard for the Eighteen Club were conspicuous features of the game.

NOTES.

In a large office building recently erected in Cleveland, known as the Rose building, compressed air is supplied to the offices, being intended as an attraction to physicians and dentists. A 6 x 8 x 8 inch Marsh compressor operated to maintain a pressure of 40 pounds to the square inch and a pressure tank 3 feet in diameter and 8 feet high are located in the basement and a 2 inch main is carried around the basement supplying a number 1¼ inch risers. Branches are taken trom these under the wood floors and a ¼ inch pipe carried to an outlet in each room at the chair rail. A similar system of piping, only of larger sizes, has also been installed for supplying illuminating gas for mechanical purposes, the illumination of the building being electric, and the heating, steam. The gas outlets are at the floor to distinguish them from the air outlets, which are at the chair rail as stated.

Under the same pressure a clean brass or lead pipe will generate a much greater velocity of flow in any fluid than a clean iron one, all other conditions being the same. The difference is ascribed by Sullivan in his "New Hydraulics" to the difference in specific gravity of the metals composing the pipes. It does not follow, however, that this comparison holds between all substances. It does hold between the metals and in general between the various grades of one specific substance. Thus the metals may be compared and the advantage with the denser ones. But there are substances much lighter than metals which give a greater flow with the same head. Thus, an asphaltum coated pipe will carry considerably more water with the same head than an ordinary plain pipe. There are various grades of asphaltum and the purer qualities are found to give the best results. So it is apparent that comparing different grades of the same substance, or related substances, the advantage in friction coefficient will be in favor of the denser one.

LEGAL.

Building owners should be warned that if there are law-suits about their property there is great risk in making charges against the architect or builder. Although the amount claimed was only 70l. 2s. 11d., the case Cheale v. DePinto, which was tried at the Hastings County Court, is as much of a warning as if it were heard in the High Court. The plaintiff, a timber merchant, took over the contract for the completion of the building of a house at Bexhill. He executed the work, and the architect had certified it was properly carried out. Counsel for the defendant interposed at the beginning of the case by saying he was instructed that the words "to the satisfaction of the architect" were not in the original deed. That was an allegation of a most serious kind. But evidence was not brought forward to support it. Mr. Alton, the architect, said the orders for extras were often given in his presence by the defendant, and several witnesses testified that the defendant did give such orders. The defendant said that he told the original builders that he had decided to expend no more than 250l., and no extras were to be recognized unless there was his written authority. Two architects were called to prove that the work was inferior and the measurements did not correspond with the specification. An effort was also made to upset the claim on the ground that the original contractors had filed their petition March 10, and therefore the assignment of the balance of the contract a month afterwards was invalid. Judge Martineau decided in favour of the plaintiff, saying that practically the whole of the work to be done had been performed. There were a few deviations, but he thought every shilling claimed was due except two guineas in respect of these deviations.

The apparent ease with which actions for damages against architects arising from carelessness succeed is ominous. Two cases have been heard within the last fortnight. At Stafford, in the case of Boyes & Son v. Adshead, which was allowed to go by default, the damages were assessed by a jury. The plaintiffs complained that the work was not attended to, and said they must engage another architect. That course had to be followed, and the second architect received 32l. 10s. 6d. in fees. It was alleged that some part of the work was not properly executed. The Under-Sheriff said the claim was reasonable, and the jury accordingly assessed the damages at 52l. 16s. 6d. An adjourned case, Harris v. Babb, was heard at Wrexham. The plaintiff, an architect, sought to recover 30l. 16s. for fees. The defendant put forth a counterclaim of 150l. as damages on account of plaintiff's incompetence and negligence. The jury found for the plaintiff for the amount claimed, but they assessed the damages at 82l. 14s., and the judge said the defendant was not liable for a claim for bricks amounting to 47l. 5s. 9d., or in all 129l. 19s. 9d. From that sum was deducted 30l. 16s., plaintiff's fees, and judgment was accordingly entered in favour of the defendant for the net sum of 99l. 3s. 9d. In both instances the work done was not large, and the amount of damages is therefore more remarkable. It is too generally supposed that an architect is a privileged person, in fact an independent judge, and so long as he is supposed to act with "reasonable skill," he is secure from liability for damages. It is now evident that judges have become more exacting, and unless it is manifest that other architects of experience and skill would act in the same way, a claim for damages has a chance of succeeding. The remedy, of course, lies with architects. —London Builders' Reporter.

PUBLICATIONS.

A general treatise on school architecture, by Edmund M. Wheelwright, architect, of Boston, has been published by Messrs. Rogers & Manson, of that city. Examples are presented of the most typical and practically suggestive schools of Germany, Austria, Switzerland, the Scandinavian countries. All details of school construction are considered, yet the information is studiously condensed within the limits of a convenient handbook, which is made readily accessible by an unusually full index.

A new book on mill construction prepared by Mr. H. G. Tyrell, C.E., has been issued by the Engineering News Publishing Co., of New York. It treats of the general design of this class of buildings, contains descriptions and illustrations of details of construction and gives figures and diagrams showing the loads which may safely be imposed.

TORONTO INDUSTRIAL EXHIBITION NOTES.

The Canada Foundry Company, Toronto, had a complete display of structural iron and steel work, fire escapes, iron stairs, etc.

Rice, Lewis & Son Company, Limited, Toronto, in a special building had an extensive display of brass mounted beds, mantels, tilings for floors and walls, bronze builders' hardware, etc.

The warerooms of the Gurney Foundry Company on King street west, contained as usual an interesting display of all kinds of heating appliances, and received many out of town callers.

The Pedlar Metal Roofing Company, Oshawa, had a very attractive display in their own separate building of metal ceilings, fireproof windows and wire-bound glass, spun metal, relief work in copper and zinc.

The Dominion Radiator Company, whose works are in proximity to the Exhibition grounds gave a cordial welcome to many visitors who dropped in to inspect the numerous styles of radiators in their well appointed show rooms.

The Gurney Tilden Company, Limited, Hamilton, had in their own building a large display of stoves, furnaces and builders' hardware. The building was very prettily decorated with bunting. Mr. A. J. Brenton, Toronto representative, was in charge of the exhibit.

The Imperial Varnish & Color Company, Toronto, had an original display of high grade architectural varnishes for interior and exterior finishing, also their famous "Grantitine" floor finish and "Elastilite" varnish for interior and exterior use. All varnishes are put up in cans with the company's name and address stamped on a brass seal.

In The Canada Radiator Company's advertisement in this issue appears a photo of their exhibit, which shows a few of the artistic designs of radiators manufactured by them. While they endeavor to give a radiator of handsome appearance, their chief feature is the system of circulation of water through the radiator. By causing the water to pass alternately up first and down second section of entire radiator, they secure a distinct difference in temperature of water in return and supply pipes and in consequence a positive and rapid circulation is maintained.

The Metallic Roofing Co. had one of the most attractive and original exhibits in the Main Building, the special feature which attracted crowds of people being a dome temple finished in white marble and built of sheet metal. In this temple was a twenty-five ton coining press in operation which stamped the Company's name and address, and formed a very neat twentieth century souvenir in six colors. In addition this company were showing metallic shingles, embossed plates for interior decorations, steel lathing and general architectural sheet metal work.

One of the largest exhibits at the Exhibition was that of Clare Bros' & Company, Preston. It consisted of a complete line of stoves, ranges and heating systems, including a number of new lines recently added. The most prominent feature was their "Hecla" furnace, to burn coal or wood. They have found it necessary to manufacture the "Hecla" in a series of five sizes to meet the several requirements, the largest sizes suitable for schools, churches and public buildings. The "Preston" boiler attracted considerable attention from parties interested in hot water heating. The construction of this boiler is entirely different from any other make. It provides vertical circulation, with its water-ways thoroughly surrounded by fire, and being a one-piece boiler is entirely free from joints and is practically a self-cleaner.

Mr. Baines, the eastern representative of the Preston Metal Shingle & Siding Company, was a visitor at the exhibition.

The J. F. Pease Company, Limited, Toronto, had a large and varied dis play of hot water boilers, wood and coal furnaces, combination heaters, etc. The company also exhibited a new apparatus for which they control the Canadian patent, the "Ideal" Heater and Ventilator for schools and churches. It is claimed by the Company that this heater will furnish a thorough system of heating and ventilation for buildings which have no basement. The new "Economy" hot water boilers have several original and effective features of construction. The company claim that this boiler has the largest area of heating surface exposed to the direct rays of the fire of any round boiler on the market. The joints are made with screwed nipples and no bolts, gaskets, or packing of any kind are required. Another feature is the ease with which the boiler can be set up; it being claimed that it can be erected in less than half the usual time.

STUDENTS' DEPARTMENT.

ANCIENT ENGLISH CATHEDRALS.

Winchester, in its earliest form, must hold the place of the most ancient. The original cathedral claims, on very apocryphal authority, to have been built in 177, by the newly-converted British King Lucius, on the site of a great Pagan temple. Another was built in 313, and another in 871. The present pile, regarded in its various parts, is of at least seven principal dates; and if viewed in its minor features, its smaller accessories, its remodellings, and its restoratians, must be pronounced to belong to ten centuries. The oldest parts of the edifice belong to a pile in the Saxony style, by the famous architects and bishops of Winchester, to Ethewold in 980. Lichfield Cathedral is said by some authors to have been erected in 300, and by others in 667, and rebuilt in 700. Canterbury is very ancient; it is said to have been founded by St. Augustine, as also is Rochester. They appear to be of about the same date. The former was founded in 598, and partially rebuilt in 1080; the latter between 600 and 1000. Exeter had a cathedral standing in 1050.

THE COLONNADE.

Colonnades are of various forms and dimensions, and assume different names according to their application and uses says the Builders' Reporter. When in front of a building or in the interior of a quadrangle they are called porticoes; when surrounding a building of any shape, peristles; when double or more, as in some of the ancient temples, and the circular peristle in front of St. Peter's at Rome, they are polystyle. No people have made more use of colonnades, or with greater effect, than the ancient Egyptians, many of their temples being literally thickset, both in the interior and exterior, with colonnades of every description. The Greeks were more simple in their arrangement, and their colonnades were mostly distributed into porticoes and peristyles, both monostyle and polystyle. Their most magnificent example is perhaps the Temple of Jupiter Olympius at Athens. Baalbec and Palmyra present also various examples of splendid colonnades. Of modern works, the magnificent colonnade of the Piazzo di San Pietro at Rome, the work of Bernini, is at once the grandest and most beautiful. It consists of 280 columns, and 48 pilasters of 40 feet high, raised on three lofty steps. It is surmounted by a balustrade, on which are 88 colossal statues 15 feet in stature. Colonnades are among the most beautiful and splendid works of architecture, and in the hands of a man of taste and science are capable of the grandest and most imposing effects.

Mr. J. Wilson Gray, architect, of Toronto, is at present on a visit to Great Britain.

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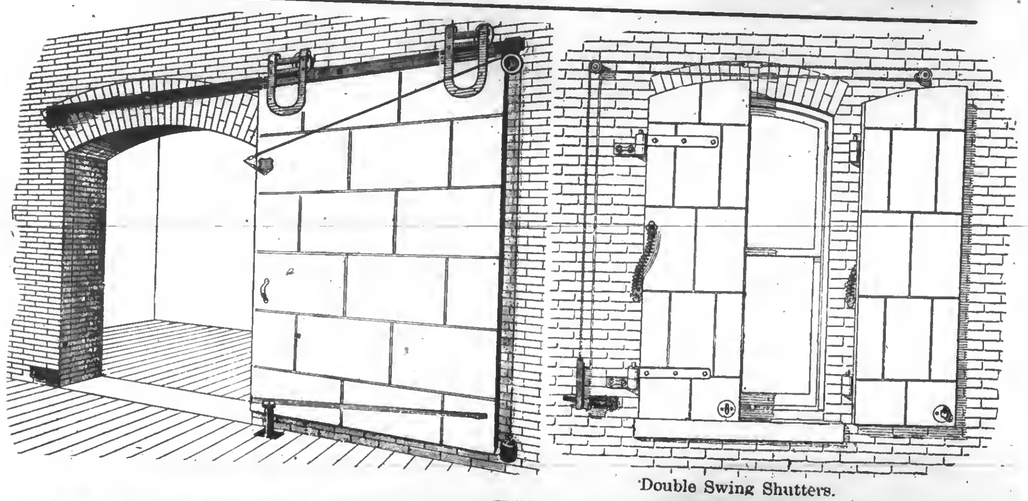

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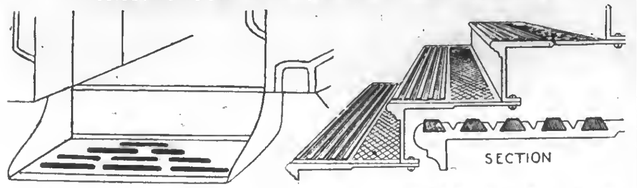

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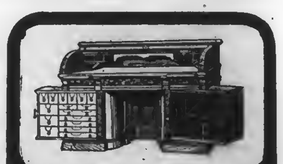

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THE TORONTO ENGINEERS' CLUB.

The first meeting of the above club following the summer vacation, was held in the club rooms, King street west, on the evening of the 3rd inst. In the absence of the president, the chair was occupied by Major Gray.

Several new members were elected and other business transacted.

A letter was read from the secretary of the Canadian Society of Civil Engineers, stating that the proposed summer meeting at Buffalo had been abandoned owing to the few favorable replies received to the circular sent out to members.

Owing to the unavoidable absence of the author, the paper announced to be given by Mr. Cecil B. Smith, on "Parks, Squares, and Drives for the City of Toronto," and the anticipated discussion thereon, was not forthcoming, but will probably form the chief feature of the programme of the next meeting to be held on the 1st of October.

Part III of Engineering Studies by Charles Evan Fowler, M. Am. Soc. C. E., published by the Engineering News Publishing Co. of New York, is devoted to descriptions and illustrations of some of the most celebrated stone arched bridges of England.

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The King of Siam is said to have in one of his country seats a pavilion of a very extraordinary kind. The tables, chairs, and cabinets with which it is furnished are of crystal; the walls, roof, and sides are formed of glass, 1 in. thick and a fathom in breadth, and so finely united with mastic as transparent as glass itself that not a drop of water can penetrate the building. A Chinese engineer constructed the pavilion in this manner as a certain remedy against the insupportable heat of that country. It is 28 feet in length by 16 feet in breadth, and is placed in the midst of a large basin, paved and covered with marble of different colors. The basin can be filled with water in a quarter of an hour and emptied as rapidly. When those who are to occupy the pavilion have entered the gate is shut, the seams stopped with mastic to prevent the entry of water, and, the sluices being opened, the large surrounding basin is filled to the top, so that the whole pavilion is placed under water, with the exception of the top of the dome, which allows for the passage of air for the respiration of those within. Nothing can be more delightful than the agreeable coolness enjoyed in this delicious pavilion, while all around is scorched and burnt up by the intolerable heat of the sun.

Imitation marbles have been made from the fine dust of certain woods and the dust of ivory and similar waste. A mixture of sawdust and phosphate of lime with a binder has been used as a material for taking casts of sculptures, and has been called "Similibois." Slabs for parquet floors have also been made from sawdust, as well as plates for bas-reliefs, art castings, panels and decorations. Terra-cotta lumber and artificial lumber are both instances of the utilization of sawdust. Sawdust compositions have also been used for sidewalks and dinner plates."

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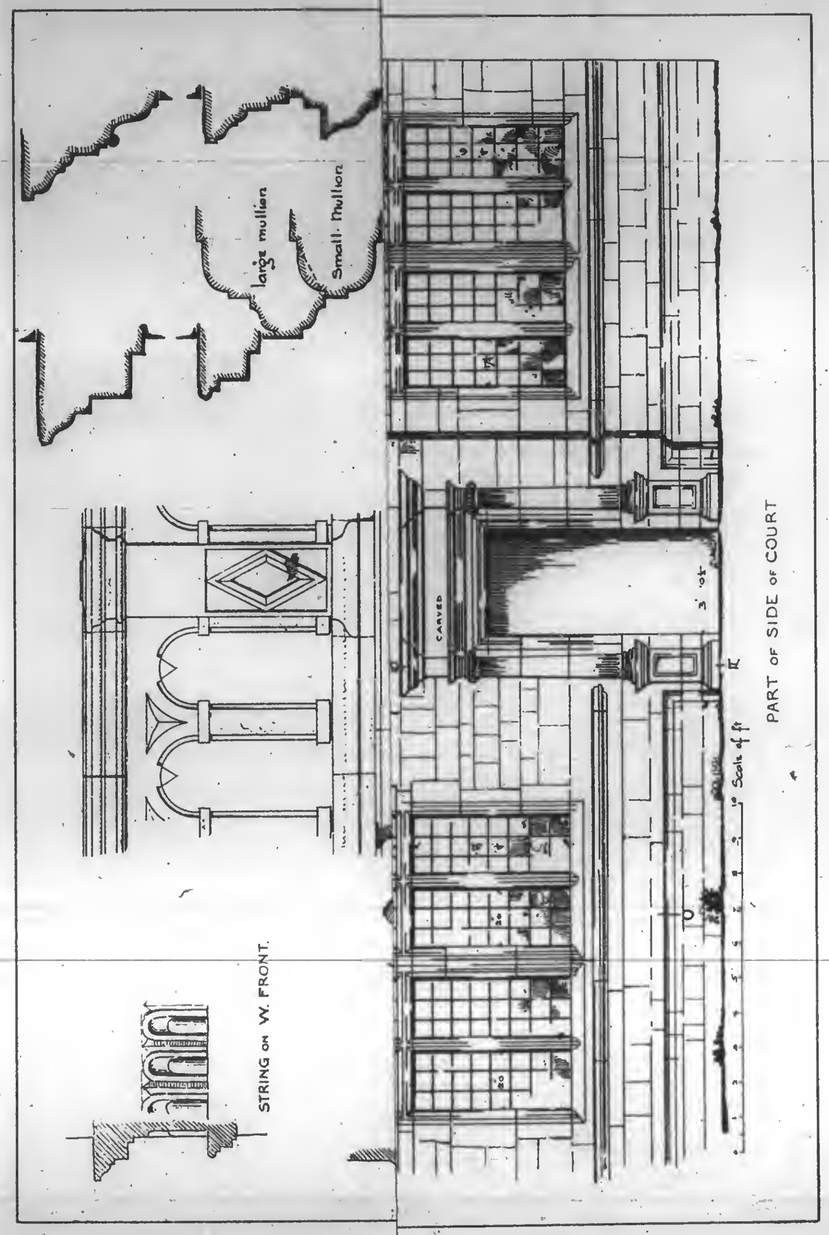

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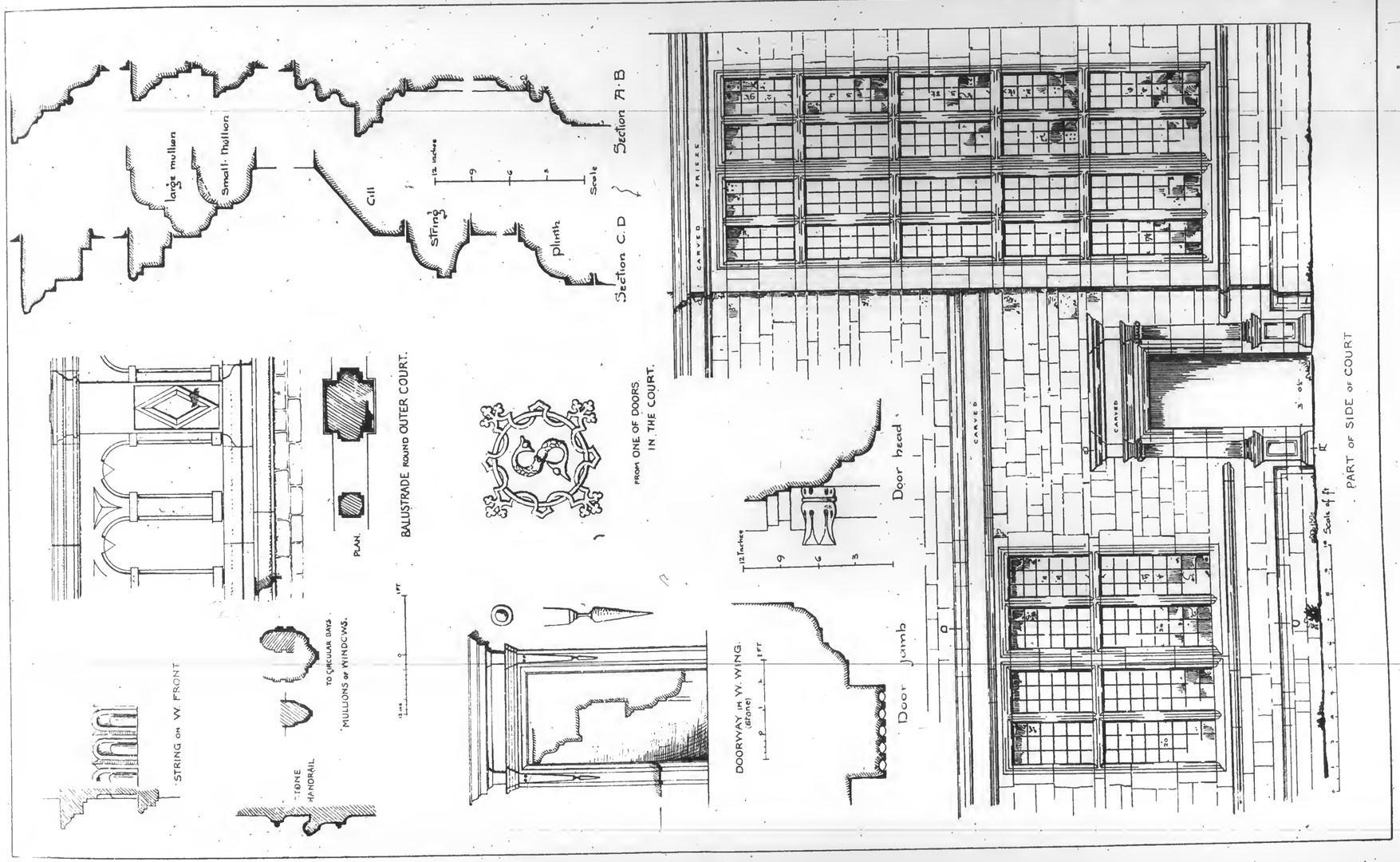

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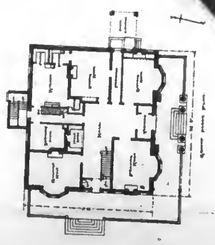

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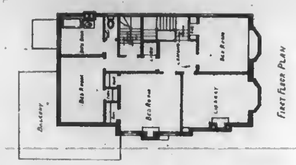

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SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
SEPTEMBER, 1901

INTERIOR OF DOME, FINE ART GALLERIES (PERMANENT BUILDING) INCLUDED IN GLASGOW EXHIBITION.

The Canadian Architect and Builder

VOL. XIV.—No. 166. OCTOBER, 1901.

ILLUSTRATIONS ON SHEET.

Bungalow, Fort Street, Victoria, B. C.—R. M. Fripp, F.R.I.B.A., Architect.

ILLUSTRATIONS IN TEXT.

Cottage, One Storey and Basement, Two Elevations and Plans.—R. M. Fripp, F.R.I.B.A., Architect.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Carvings on Public Library Building, Westmount, Que.—Robt. Findlay, Architect; G. W. Hill, Sculptor.
Photogravure Plate.—Dominion Bank, Winnipeg.—Darling & Pearson, Architects.
Photogravure Plate.—Kirby Hall, South Side of Court Yard.

CONTENTS

Editorial	169-70	Sewage Disposal in Summer Resorts	175-76
Notes from Pan-American Exposition	170-71-72	The American Institute of Architects	176-77
Canadian Society of Civil Engineers	172	Toronto Engineer's Club	177
Lectures on Architecture	172	Canadian Art	177-78
Office Building Wiring	172	Ontario Association of Architects	178
Manitoba Correspondence	173	A Canadian Architect in Korea	179
Fire Prevention	174	King Alfred was an Architect	179
A Sulphur and Sand Cement	174		

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The Royal Visit.

Canada tendered a right Royal welcome to the Duke and Duchess of Cornwall and York, who have just left our shores after a month spent in visiting all parts of the Dominion. It is to the credit of our future King and Queen that they should have undertaken a nine months journey, traversing two-thirds of the earth's surface, with the object of acquainting themselves with the people and conditions existing in the various parts of the great British empire. The information which they have acquired will enable them to more capably discharge the functions of their high station. The people with whom they have come in contact feel that the bond of sympathy and loyalty which binds them to the Empire has been further strengthened. Great commercial advantage is also likely to accrue to Canada from the descriptions of the country and its resources and opportunities written by representatives of the leading British and American papers who accompanied the Royal party.

Building Conditions.

THAT a large volume of building is in progress throughout Canada is evidenced by the scarcity of tenders for work of ordinary character as well as labor skilled and unskilled. It is not unusual of late for an architect to solicit tenders from a dozen contractors and receive but one or two. Skilled workmen in all trades are in demand, and there are also too few laborers. The requirements in some trades are said to have been met by bringing in workmen from Buffalo, where, according to the observation of Canadian visitors, there is not to be seen a single residence in course of construction. While a high degree of prosperity prevails in Canada, there is no perceptible tendency towards a building boom. The activity is the result of a legitimate demand for more and better buildings.

Development of the Canadian North-west.

The encouraging statement has lately been published that of the 23,000,000 acres of land granted as railway subsidy by the Dominion Parliament to the Canadian Pacific Railway Company, 9,000,000 acres have already been sold. Most of these lands extend along the line of the railway, but there is also a large tract in Northern Alberta. The rate at which the land is being taken up in the Northwest is the best assurance that in a few years a large population will flow into that territory and develop its agricultural and other resources. With the population will come a steadily increasing demand for the skill of the architect and builder, and for construction materials of all kinds adapted to the climate and the requirements of the people. The illustration pages of this number show the development in this direction which has already taken place at Winnipeg, where some of the leading banks and other financial institutions have erected buildings which in point of cost and dignity of appearance are fit to grace the streets of any city in the world.

The Canadian Exhibit at Buffalo.

The impression given the visitor to the Canadian Building at the Pan-American Exhibition is that Canada is a purely agricultural country where buffalos, bears and all manner of wild animals abound. The building contains only specimens of grain, wild animals and furniture. While it is important that the advan-

ages which we can offer to the farmer, the sportsman and the tourist should be adequately displayed, our capabilities in art and industry should also have prominence, otherwise strangers will receive a wrong conception of our rank among the more highly civilized countries. It is true that the art gallery contains a small exhibit of pictures by Canadian artists, that in the Mining Building are to be seen some excellent samples of Canadian ores, and that in other departments such as live stock and farm and dairy products, Canada is well represented. But these exhibits are divided among various buildings and therefore do not impress the visitor as would a collective exhibit in one building. At least half the available space in the Canadian Building might profitably have been used for small, attractively arranged exhibits which would have served to give the visitor a bird's-eye-view of Canada's resources and development in a dozen or twenty different lines, and a measurably accurate idea of her advantages as a place of residence. People of refinement are loth to remove to a raw country, and it is to be feared that the character of many of the exhibits which we have made at foreign exhibitions has been such as to convey the idea that Canada is that kind of a country. Perhaps the best method of removing any such false impressions would be to inaugurate in Toronto on a suitable scale a Dominion Exhibition, and invite foreigners to come and see for themselves the beauty and capabilities of our country and the skill of our people.

HALF-TIMBERED DWELLING HOUSE FROM PRUSSIAN SAXONY.

The Toronto Building By-Laws.

REFERENCE has been made on several occasions to the necessity for a thorough revision and compilation of the enactments of the Toronto City Council for many years past with respect to the erection of buildings. The legislation on this subject has been of a fragmentary character, extending over at least a quarter of a century. When enacted the various by-laws were printed separately on sheets or in pamphlet form. No attempt was made at compilation in one volume. Many of the by-laws are now entirely out of print, and architects, builders and others are consequently unable to learn what are the provisions of the laws which are supposed to govern the construction of buildings. Such has been the confusion which has existed for many years past, that even the officials whose duty it was to see that the laws were observed, were unable to interpret them. The condition of affairs is well illustrated by the fact that there is declared to be no restriction to prevent the erection of factories, livery stables and such like constructions on the most choice residential streets. We have in mind an instance in which the rear wall of a six or seven story block has been built close alongside a well designed and cosy home on an attractive west end street. The owner of this home is thus without warning deprived of beautiful surroundings and much of the actual value of his property. Something might be accomplished if the present shameful condition of things were pressed upon the attention of the council by a joint deputation from the Ontario Association of Architects, the Guild of Civic Art, the Builders' Exchange and real estate interests. It will be remembered that some years ago a new building by-law was drafted and submitted to the council by the O.A.A., and that was the last that was ever heard of it. Although it involved the arduous labor for many months of a committee of the leading architects of the city, it apparently never got beyond the pigeon-hole in some city official's desk. If the council have not the time or disposition to grapple with this important matter themselves, it is due to the many interests affected, that following the example of the city council of Montreal, they should avail themselves of the work which has already been done by public spirited citizens.

NOTES FROM THE PAN-AMERICAN EXPOSITION.

As comparison with the World's Fair seems to be inevitable for any one who writes about the Pan-American, this comparison may be made—that the Buffalo Exhibition, from the comparatively small space it occupies is, as a study, more within the range of practical politics. Its area of 350 acres is not far beyond the area necessary and feasible for permanent exhibition grounds, and a study of the sources of its beauty is likely to have practical application in the question, which is a live one, how to improve such grounds.

The popular cry all summer has been about the "colour scheme" and the illuminations. Both are in consequence somewhat disappointing.

After so much talk we expect to find the "Rainbow City" a striking exhibition of colour; but it is not. The colour is harmonious and pleasing, but not bright. One does not think of the buildings as coloured. They are not white, that is all. And being neither white nor coloured—essentially coloured that is to say—they are in that respect out of touch with the spectacular idea; they class, in appearance, with the permanent monuments of architecture and are so far, in spite of their beauty, imperfect. The buildings of the World's Fair were criticized by the French as crudely academic. The more freely designed French Fair buildings may be as good or better, (it is hard to judge from such illustrations as we see,) but it certainly seems, in recollection, as if the very academic character of the Chicago buildings, and their improbable whiteness, was the source of their success. They were an abstraction; something outside of ordinary experience; the sort of buildings that are usually left to painters or poets, "who," as Bacon says, "build at small cost."

The designers of the Buffalo Exhibition adopted colour as part of their plan, with the avowed intention of making a variation from the effect of the Chicago buildings. But to compete with the Chicago buildings;

to approach no nearer to the prosaic, it was necessary to transcend ordinary building material in colour as much as the World's Fair did in purity. It cannot be said that this has been done; the problem of a coloured fair is open for further development, but it will take a mighty man to tackle it.

Apart from the misleading of the popular cry, there is no cause for disappointment in the buildings. After all it is not the buildings that make the Fair so much as the grounds, and these are a triumph of spacious appearance, combined with a real compactness which, to one who toiled over the long distances of the World's Fair, is an unexpected joy. It is the plan of the grounds that is the principal source of beauty and will best repay study, for this gives the key to the successful planning of a pleasure Fair. Buildings are the main motive and give character to the whole, but their architectural function is to form a background for the spaces. A good sky-line and mass, and a play of light and shade, are the principal necessities. It is impossible to take any real detailed interest in the reduplicated enrichments which form the detail of such buildings; they are of use only in the broad way, to mark points in the design and to give it scale. A Fair is an open-air show and the real enjoyment of it is in sitting down and viewing some portion of the scene. A building thus gets real attention only as a whole, as a background for a space.

The grounds should constitute the beauty of a Fair quite as much as the buildings; each is equally dependent on the other, and the Pan-American forms an admirable study of the successful treatment of grounds, to give them interest and beauty and to assist the perception of space. One may deduce from it principles for guidance such as the following: Trees and shrubs are valuable not only for their individual beauty but for the softness of their texture and their rounded forms; a balustrade shows perspective like nothing else, and without insisting too much on hard lines; water is invaluable as a level surface with which everything else is unconsciously compared; all isolated objects near at hand give tone and scale to the distance, and upon these all possible beauty of detail should be lavished, for the eye occupies itself with them particularly. Statues are, of course, capable of the greatest beauty, and their white colour is a gain in the neighborhood of foliage, but dark objects help the sense of space better, and the Pan-American has examples in its band-stands, kiosks, fixed seats, flag poles and lighting posts, of useful objects which are made ornamental and assist the general effect. The advantage of fountains seems to be to a great extent their varying motion; the restlessness of the water produces peace in the beholder. A scene or building is more likely to receive attention and appreciation if there is a fountain in the foreground. Motion is also, no doubt, one source of the pleasure we receive from flags, and a constant irruption of kites in the sky over one corner of the grounds of the Pan-American—which certainly did add to the gaiety of the scene—may have been official and had a scientific intention in the same direction. One is reminded of Mr. Olmsted's prescription of waterfowl for the lagoons at the World's Fair, to induce movement and sparkle in the reflections. At the Pan-American this is carried too far. The fountains in the main court rise from the principal basin and fall back into it, troubling the water so much that there are no reflections. Is anything quite so useful as a reflection? It makes composition automatically. Who has not seen a familiar bit of common-place roadside turned into a picture, when the melting snow forms a pond large enough to reflect a tree or a bit of sunset? The canal at the Pan-American was too narrow to be of much use in this way, and it did not appear to be an attraction except when the illuminations were on, which brings us back to illuminations, and the consideration of why they disappointed expectation.

In the first place the much-talked of gradual illumination was evidently only a device to save the electrical arrangements from strain. The public seem to have agreed that it was a wonderful spectacle to see the lamps glow a little at first and increase gradually to full power. The present writer experienced nothing but impatience, until the light came out to its proper strength. The genius of electric lighting is for sudden illumination, and if it could have been arranged to flash the whole thing out at once there would have been something to talk about; as it was, it is necessary to record a disappointment.

When the light was out in full force it was certainly fine, especially the tower, where the lights were thickest, giving the effect of massed diamonds. But one did not look long upon it, nor did those people do so whom one heard saying it was worth coming such numbers of miles to see. Why was this?

The truth is that the illuminations were—if one may use the word for anything so splendid—a little dull. They did not illuminate, in the primary and Pickwickian sense of lighting up. The buildings were completely extinguished and in their place appeared rows of lights marking out the main lines of the structure, like a pattern in pin holes held up before a light. It was a transformation scene all right, but when seen it was seen. There was nothing to watch, the lights did not even twinkle.

At the World's Fair, in which the illuminations were rudimentary by comparison, there was one feature which might give a clue to a more interesting mode of illumination. Surrounding the dome of the Administration Building were torches of natural gas, flaming many feet in height, which occupied the eye more than all the rest of the illuminations, not only from their own appearance, but from the play of light they cast upon the dome. Gas torches form part of the iron fence of some clubs in Pall Mall, and the light which the street and buildings receive from them, when the gas is turned on for a great occasion, is peculiarly exciting. It is a question af movement again. The frozen music of the Buffalo illuminations is too frozen to retain attention long, except, by the way, in the canals. These are uninteresting by day, because they are too narrow for the reflection of the buildings along their sides to appear as reflections; a surface of dirty water is all that catches the eye. But at night, when, under the illuminations, the passage of boats ruffling the water makes its surface a surface streaked with dancing fire, the canal, which is deserted by day, becomes popular.

Something of the nature of the waving light from gas torches, cast upon the buildings and grounds, would make a more beautiful scene at night than do the present illuminations, and the interest would be sustained by a sort of liveliness in the light and shade.

But the use of such enormous quantities of gas as would be required seems indefeusible. To use gas is to use material, whereas the production of electricity, where waterpower is available, is a mere matter of the wear of a few engines. Electricity is the available means of lighting. But its possibilities are not confined to strings of lamps, and a hint may be taken from the lighting-up effect of gas.

There are details of the Buffalo illumination which show how lights placed on the retired surfaces, instead of on the projecting surfaces, show up, with delicate tones of light and half light, the places of the building. This by itself would have more in it than the pin-hole system of making out only the leading lines. It is the difference between a line elevation and a perspective in light and shade.

The search light on the tower was also suggestive. The business of the search light was to pick out the statues and fountains in the principal court and show them up against the dark sky. Its efforts were a relief to the monotony of the general illumination. It showed things up instead of concealing them, and showed them up in a striking way. Even the movements of the search light from point to point were worth following. When it was changing its point of application and feeling about for another statue, the green of the grass under its glare was of extraordinary brightness, and suggested how brilliant the scene would be if lighted up by an application of this kind of light.

What is wanted is a combination of methods. There are three that may be used: 1st, the application of diamonds (clear lamps) and pearls (clouded lamps) to the outer surface, as at Buffalo, to decorate such features as should receive particular distinction; 2nd, a general scheme of lighting up surfaces by lamps concealed or withdrawn from view, on reverse or retired planes; 3rd, the use of search lights, that is to say, of lights thrown from an external point, in order to produce pictorial effects, to key up some portions of the scene above the rest, with possibilities of moving or mingling lights and perhaps of a suspicion of colour.

Of these three methods, the designers of the Pan-American Exposition adopted, it may be safely said, that with the least possibilities. We can judge therefore, from the splendour of the Buffalo illuminations, what may yet be done.

W. A. LANGTON.

CANADIAN SOCIETY OF CIVIL ENGINEERS.

At the first regular meeting of the season of the Canadian Society of Civil Engineers, a discussion took place on Mr. Cecil B. Smith's paper on "The Sewage Output of Toronto," read at the last spring meeting.

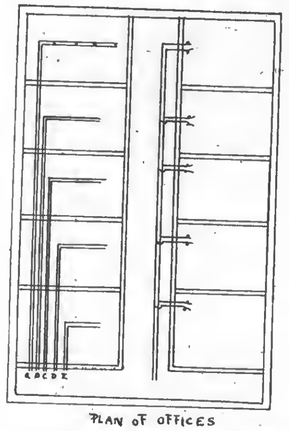
LECTURES ON ARCHITECTURE.

Prof. Capper has commenced the delivery of a series of lectures at McGill University upon "Architectural Styles, their Features, Mouldings and Ornament." The course is preparatory for the examinations qualifying for associateship in the Royal Institute of British Architects, the Royal Institute having announced its intention of holding such examinations at colonial centres. It is intended specially for architects in practice, and their assistants, who may be unable to attend lectures during the ordinary working hours of the university. It comprises a study in detail of the three great divisions of historical architecture, Classical, Mediaeval and Renaissance, in accordance with the programme of the Royal Institute, the lectures being illustrated by diagrams, lantern-slides, and casts. The lectures will be given in the architecture class-room, Engineering building, Monday, Tuesday and Thursday, from 5.30 to 6.30 p.m.

OFFICE BUILDING WIRING.

The difficulty is constantly arising in office buildings regarding meters for single offices or en suite. Architects find it difficult to foresee who will probably occupy offices in a building at the time it is wired, and it is impossible to know how to arrange the feeds for meters. If a separate feed is put in each room, some tenant comes along and may require a suite of three rooms or more, or possibly a whole flat, and then arises the difficulty of arranging so that one meter will do for all. At present wires have to be run through the walls from one room to another to accomplish this end, which necessitates a lot of unsightly wires and also damage to the building, and then it is not a job.

By referring to the cut it will solve the trouble. On the right hand side of the corridor the wires shown represent the usual method employed. It will show a feed wire running the length of corridor and a tap running into each office. On the left hand side is the



method I recommend, and which, although familiar to some, is not generally known. I have recommended it and installed it in several cases, and it gives great satisfaction.

At some convenient location on each floor, space is either found or provided to receive all the meters for all offices on the same floor, and the letters A, B, C, D and E represent the circuits radiating from this meter board, to each office. By this means any two or all offices, or in fact any combination required, is made in short order behind meter board without any defacing of walls or make-shift arrangements being resorted to. We have in some cases wired buildings and had all the meters in the building in one cupboard in basement. This is satisfactory for small building, but for large building each floor should be equipped as above.

H. F. STRICKLAND.

Toronto, October 10th, 1901.

NOTES.

The management of the Central Canada Fair at Ottawa have decided to purchase yearly a number of pictures from among those sent by artists to the Fair, thus in time to establish a permanent art gallery. This year five hundred dollars worth of pictures were bought. The result has been that a number of well-known artists have signified to the secretary their intention to send each year in future not less than four pictures to the collection at the Fair.

MANITOBA CORRESPONDENCE.

Most of us no doubt have frequently heard the expression, "The unexpected is sure to happen." When all things seem to be running smoothly a break occurs and the whole machinery is out of gear. This in some measure illustrates what has been taking place in this city during the past weeks.

It was news to most of us that there was any trouble between the carpenters and the contrcctors, and we were looking forward to a good season's work free from strikes or any of those labor clouds which sometimes darken the horizon and obscure the sky of building prosperity.

To measure up and make a fair estimate of the whole subject is not an easy matter. Whichever way the scale may turn there is always the other side to reckon with, so that it is necessary to handle a contention of this nature with great care and intentional impartiality.

We find that a large number of the carpenters have been on strike for the past two months. They contend that they are not paid enough for their labor, and we think in a measure their contention is grounded on a good foundation. That the better class of mechanics in this branch of the building trade should be paid a higher rate of wages is we think allowed by all fair judges of such things, but there seems to be a desire on the part of the men to obtain a high standard wage for very inferior labor.

A man should be paid what he is worth and the times will allow, but good men should not be placed on a plane with inferior men, and to ask for such men 40 cents per hour with the addition of 10 cents, 20 cents or even higher per hour for over time, is out of the question. There is a large amount of unskilled labor in the market, useful and necessary no doubt in its place, but it should be remembered that this labor should not expect to receive the same wage that high-class labor can command.

Some two years ago a carpenters' strike took place here which ended in an arbitration, and the terms were that the minimum wage was to be 27½ cents per hour. This arrangement the men say was not satisfactorily carried out by the contractors. This may or may not have been the case, but the jump from 27½ cents to 40 cents per hour as the minimum wage, is in our estimation too great. Nor do we think the men ever expect to get this, but are really working and striking for the purpose of getting the contractors to acknowledge and treat with their union, which the contractors on their part say they will not do. So the matter rests, and in the meantime men are out of employment, work is delayed, some of it being put off for another season, while a bitter feeling to some extent is growing up between employees and employers.

We think the men as a body made some mistakes from their own stand point. The time selected was not a right or proper time to fix matters of this kind. It should be done before work starts, which would be fair and right to all. Public sympathy would be more likely to follow them than at the present time. Again the effort does not seem to have been a united one on the part of the whole trade, and consequently cannot expect to be the success it otherwise might have been. Besides as has been stated the minimum wage is set too high, and to make this a lever to compel contractors to acknowledge a union which has no standard of excellency, but only a standard of membership, is bad in principle.

As to the contractors we think some action should be taken by them to try and arrange on a fair basis disagreements regarding wages. Men should be paid a proper renumeration for a fair day's work, good men should be encouraged by good payment, for the class of work done, so that by this means a higher standard may be obtained. If the arrangement of two years or so ago has not been carried out in a fair or honorable manner, then we say it should be, and no advantage should be taken of workmen who have their labor to sell.

A fair and honorable dealing between employer and employees will conduce to a better state of feeling and assist to bring about that happy time when strikes shall be a thing of the past.

Since the above was written the strike has been declared off by the men, but with the notification that the same demand will be made early in the coming year. We cannot estimate on what may or may not take place in the future, but we think the demands of the men must be somewhat altered before they are likely to be accepted by the contractors. We trust that for their own good the men will see this and that another strike will be averted.

The building trade has not been very brisk this fall for some reason or other; we presume the strike has much to do with it. Work let early in the season is being wound up, so that from what may be seen just now building operations will close early.

In our rambles we have noticed in a brick building now nearly completed that there has been adopted a certain class of iron construction. In fact almost the whole work above the basement has been carried on iron girders supported on cast-iron round or box columns. Does it not seem bad practice at this date to depend on cast-iron to support a heavy building? Is there not danger in case of fire? These supports may become heated to such an extent that a stream of cold water striking them would cause fracture, and thus endanger the safety of the structure. From the position of these supports it would seem out of the question to cover them with a proper fire proof covering. Cast-iron unprotected does not seem to be the safest way of supporting bricks and mortar.

During the past summer there have been some heavy rain storms in this city, when such an amount of water fell that some of the sewers were not large enough to carry off the flood, and in consequence the water backed up in the cellars, and in one instance we know of the pressure of the water was such as to lift the cement floor at the centre. On investigation to find the cause of this unusual occurrence it was found that the cover of the catch basin was closed and weighted down by goods, and that the water not having this outlet, spread through the weeping drains, penetrated under the floor and exerted sufficient pressure to lift the cement top and crack it. The question arises should a rain fall of such exceptional character be taken into calculation when figuring up the capacity of sewers to carry off flood water. To work on the basis of an average rain fall would not meet the case, so we presume the only way is to run chances as a thing of this kind may not occur for years. Still it is a factor in general sewer construction, we might do well to consider and in some way arrange for.

Winnipeg, October 5th, 1901.

FIRE PREVENTION.

There recently closed at Berlin an exhibition of materials and appliances designed to prevent destruction by fire. The exhibition was housed in temporary buildings erected for the purpose on a site in the suburbs of Berlin having an area of 80,000 square meters. Some of the exhibits were shown in the grounds surrounding the buildings. The exhibition was divided into six sections, as follows :

1, Fire Extinction ; 2, Assistance in case of Need and Danger ; 3, Street Cleansing, Street Paving and Cognate Works ; 4, Fire Prevention ; 5, the well-being of the personell of Fire Brigades ; 6, Art, Literature and Education.

From the Builder it is learned that " Section 4 was one of the most extensive sections in the Exhibition. A great deal of ingenuity was devoted to the production of novel forms of fire-resisting construction, some undoubtedly valuable from a scientific point of view, others valuable only from a commercial point of view, being merely excuses fot building up trade. The use of iron in fire-resisting construction is very generally adopted, and its adequate protection not always sufficiently carried out. There are numerous examples of so-called fire-proof floors, for example, in which the lower flange of rolled iron joists are left exposed, but there are on the other hand, many others in which the protection of the iron is rightly regarded as an imperative necessity.

" One material which is largely employed for the protection of iron, especially in columns and stanchions, but also in girders and joists, in cork-stone, a material made of cork dust and various kinds of cement and plaster. As a non-conductor of heat and a slow burning material, this uudoubtedly is not without value. Asbestos, in combination with lime, cement, and plaster, is also largely employed in various forms. Kiesel-Guhr or fossail meal, on account of its valuable non-conductive property, is also used in various forms for the protection of iron, in bricks, sheets, and slabs, formed by a combination of Kiesel-Guhr with some cementing compound. Several firms show iron protected by rope made of asbestos, cork, or Kiesel-Guhr and jute, the chief advantage being apparently the ready application of the material, which is then usually finished with a plastered surface.

" Besides these slow-conductive materials, brick and concrete in various forms and arrangements are also employed. Very considerable use is made by many patentees of porous brick, that is, brick which has been made of clay mixed with sawdust which is consumed in the process of burning the brick, thus rendering it lighter and almost as easily ruceptive of nails as coke-breeze concrete. Hollow bricks, either of ordinary brick earth or of the porous manufacture, are not uncommon. Dovetailed and keyed bricks or blocks are in bewildering variety, and very considerable spans are shown constructed in this way. Examples of floors of 6 ft. and even 8 ft. span and only 4 in. thick are frequent. In some cases light iron rods or bars, one might almost say laths, for their thickness scarcely exceeds that of hoop iron, are used in the joints of the brickwork to give increased tensile strength to the lower part of the floor's section. An interesting development of this brick construction is seen in self-supported or hanging partition walls, some of which are quite startling, as, for example, the exhibit of Pruss & Koch, of Berlin, who show a structure of two self-supporting parallel walls 13 ft. span and 18 ft. high, with a cross wall 21 ft. span and 18 ft. high between them, with a doorway cut out in the middle of t. One of the side walls is 2½ in. thick, the other of the two thicknesses each 2½ in. thick with a space between of 6 in. The cross wall is 1½ in. thick. These walls depend largely upon hoop-iron vertical ties ; but in another instance, shown by Lorene, of Berlin, we see walls 12 in. thick and close on 15 ft. span, with a height of 7 ft. 6 in., built of keyed brick alone, without iron. These walls, moreover, carry a brick roof 6 in. thick. Thus the whole structure in this case forms a hut 15 ft. square internally, carried only on four angle piers.

Combinations of iron and concrete are numerous, and in many the construction has but a small amount of iron which is embedded in the lower part of the concrete. As an example of this, we may instance the flooring shown by Paul Zollner & Co., of conerete 4½ in. thick, 14 ft. span, with ⅜ in. iron rods 4½ in. apart. Another example is that by M. Czarnikow & Co., a floor nearly 20 ft. span of concrete, 9 in. thick, with iron bars 1½ in. by 1-16 in., 2 in. apart. As a tour de force showing what can be done with glass, the Aktien Gesellschalt for Glasindustrie, of Dresden, have erected a considerable sized pavilion wholly of glass—walls, roof and floor. Glass bricks, hollow and solid, and wired glass of various thicknesses and patterns, are the chief components of this remarkable structure."

A SULPHUR AND SAND CEMENT.

Professor Brown, a St. Louis man, is said to have invented or re-discovered a combination of sand, cement, and sulphur, which he claims possesses qualities far superior to concrete, and which can be produced at less cost than that material.

Professor Brown claims for his new discovery that it is acid-proof, a non-conductor of electricity, waterproof, a non-conductor of heat and cold, and that it is indestructible, being impervious to all attacks of fire, temperature, climate variations, time and decay. The compound can be mixed and moulded upon the spot where it is to be used, and when dried it becomes as hard as granite, and will take a high polish.

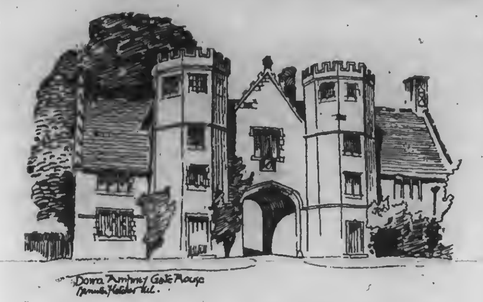
Besides being valuable for house construction, the material is available for use in the construction of sewer pipes, electric wire conduits, and water-mains. In art and decorative work it is also expected to be of use.

Professor Brown owns a piece of material which he says is known to have been taken out of a building erected 1,500 years ago, and he declares it to be the same as this new compound.

PERSONAL.

Mr. Edward Harrison, Jr., of Topeka, Kansas, chief of the engineering staff of the Santa Fe Railway, has been visiting Hamilton, Ont., his old home, after an absence of thirteen years. He was once a student in the office of Mr. James Balfour, architect.

Mr. D. Ewart, chief architect of the Public Works Department at Ottawa, has recently returned from Europe, whither he went for the purpose of investigating fire proofing materials and methods. He is reported to have expressed the opinion that none of the systems which he examined while abroad are in any respect superior, but are rather behind the methods in use in Canada.



SEWAGE DISPOSAL IN SUMMER RESORTS.

The following report presented to the Provincial Board of Health of Ontario at its last session has appeared very opportunely, and in large measure supplies an answer to problems raised in an editorial in our last number. The several suggestions made in the report are simple and inexpensive and have the merit of being practical, having been carried out as the report states in many instances under the personal supervision of Dr. Bryce. We hope to obtain from the writer individual illustrations of places where these are in operation.

REPORTS ON SEWAGE DISPOSAL IN SUMMER RESORTS AND TOWNS WITHOUT SEWERAGE SYSTEMS.

By the Secretary, Dr. P. H. Bryce.

Mr. Chairman and Gentlemen:—The disposal of organic wastes becomes, with every summer, during which decomposition under the influences of heat and moisture have gone on most rapidly, a question which every layman and physician are prepared to discuss, but which with the incoming cold weather, is allowed to remain unsettled and debatable.

When it is remembered that on the shores of the lakes and rivers adjacent to every city and town, and notably in certain districts favored either by nature or railway conveniences, many thousands of people make their summer homes in temporary structures, as tents or in small cottages, and that the two questions of a pure water supply and the disposal of house wastes are constantly associated, it is apparent that some very positive opinions should exist on the part of campers and householders as to what ought to be done, and can be done economically, and yet more positive views as to the need of regulating such resorts on the part of the officers and local boards of health.

Without dealing at length with theories of disease causation, it may at once be said that experience has positively shown that water into which animal matters pass, whether stream or lake, or by soakage into a well, cannot long be used for domestic purposes without causing diarrhoea, enteritis or typhoid. Not a day passes at this season, in which well and other water, used in houses where typhoid is present ; are not shown by the laboratory to have pathogenic microbes, whose habitat is the intestines of men or animals, present in them. In the great number o instances, at summer cottages and camps, there are but two sources of trouble, viz., house slops and kitchen refuse, and human excreta. Hence I propose to give as briefly as possible, what years of experience have proven to be a simple, efficient and relatively a inexpensive means of safely dealing with these several wastes.

Ordinary human excreta is very easily disposed of by the earth closet, placed conveniently to the cottage or camp, and having galvanized pails of good capacity used, to which leaf mold from the forest, sawdust, dried garden clay loam or peat, may be systematically applied, which will prevent all odors due to decomposition, through absorption of gases from the decomposing excreta. Such materials should be frequently removed and dug into the garden in a shallow manner, just as manure is for fertilizer. No inconvenience can result, the garden is enriched and no one portion earth need ever be saturated with organic matter.

The same method of disposal by trenching is equally available for kitchen refuse from which the watery portion has been removed in the following manner.

An ordinary oak barrel of 20 gal. capacity, or a galvanized iron bucket of similar capacity, is placed convenient to the kitchen door, into which all slops, solid and liquid, will be placed, the watery portion being separated as seen in the diagram by a removable pan with perforated bottom. A

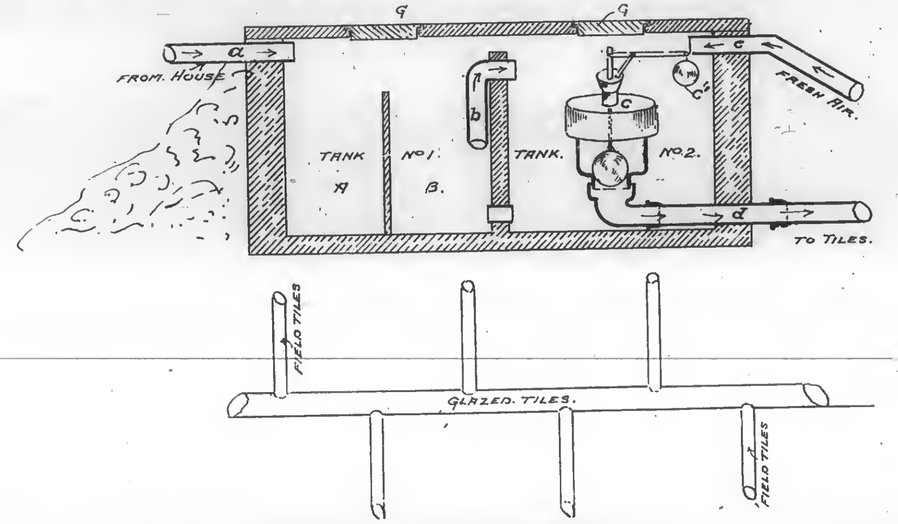


DIAGRAM NO. 1, FOR DISPOSING OF KITCHEN WASTES.

kitchen sink may, if preferred for convenience, discharge its watery contents directly to the barrel and the day refuse be there separated. From the diagram, it is apparent that liquid slops will be retained in the barrel until by a float or by observation, the barrel is filled up to the pan with perforated bottom. All that is then required is to draw the plug and allow the liquid contents to be rapidly carried away to the level subsurface tiles. A tight-fitting cover will effectually prevent any local nuisance from arising, while the tiles which are an example of intermittent downward filtration, (see Diagram 2), will have allowed the watery portion of the slops to filter away, the smaller amount remaining, undergoing decomposition, its gases being absorbed by the surrounding soil. It will be apparent that if the tiles laid,

hold exactly the contents of the barrel and are laid level with its bottom, that each will be filled with each discharge and hence will become in practice never clogged equally as those near the barrel would, if the liquids were allowed to trickle away without any pressure. The tiles, if within a foot of the surface, will readily obtain the oxygen necessary to decomposition through the soil.

It will thus be seen that for a small temporary summer dwelling with a well, spring or lake supply of pure drinking water, everything has been provided to maintain perfectly sanitary surroundings.

Inasmuch, however, as year by year these summ dwellings are being occupied for longer periods, as many summer houses are becoming large, well constructed houses with every modern convenience and water pumped by machinery, and as hotels with a capacity for hundreds of guests are springing up in isolated situations and thousands of farm homesteads are demanding modern conveniences, it is apparent that more extended methods are necessary for disposing of house wastes, so that water supplies may not be polluted, and local nuisances be prevented.

In past years, cess pools or deep pits in the soil have been used as receptacles ; but inasmuch as the soakage therefrom becomes often an excessive local pollution, endangering well water, and as they, sooner or later, become filled, other means are demanded for dealing satisfactorily with the house sewage, which, in the case of hotels and large institutions, makes thousands of gallons daily, and contains all the wastes, whether excreta, kitchen or house slops.

Fortunately the application of the same principles as already indicated for dealing with small houses are equally applicable in dealing with larger establishments. Many towns have public water but no sewerage, and owing often to the large lots and relatively widely separated dwellings, public sewers would prove an expensive matter. In all these cases the following methods have been found economical and from the sanitary standpoint, most satisfactory. The bacteriolysis of sewage or its decomposition, like manure in the soil, by the bacteria of nitrification has to-day taken its place as the most practical and scientific method of disposal of sewage known to us. It is especially satisfactory in dealing with purely domestic sewage apart from manufacturing wastes. The first essential in establishing any such system is to have the plumbing fixtures so placed as to bring all the pipes to the iron soil pipe, which is the main sewer from the building. This, brought out below the ground floor, is led to a tank, built either immediately at the house, or at such convenient spot away from it, as will enable the sewage effluent to discharge from it and to flow into a series of field tiles laid on a level with the bottom of the tank at a depth of 10″ to 12″ below the surface of the ground. Should such main iron pipe be above the ground, it can be placed on supports, or be laid on a ridge of earth covered with sod. Much discussion has gone on as to whether sewage is best dealt with by aerobes, anaerobes or both ; but to-day it may be said to be perfectly accepted that microbes which derive their oxygen from air, and those which obtain it from organic compounds, are both required to rapidly and effectively decompose or nitrify sewage. This may be done by the construction of a tank, or several tanks for different wings or portions of the building as simply made as that in the following diagram :

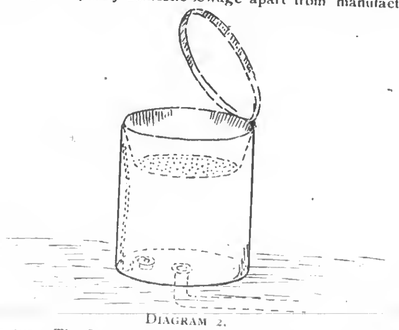


DIAGRAM 2.

The diagram shows the inlet of sewage at (a) from the house main to tank No. 1, which has two compartments separated by two planks simply laid, one above the other for lessening the amount of solids in compartment B. From this, watery sewage passes over into tank No. 2, through the pipe (b) from under the mass of semi-solid floating sewage undergoing fermentation and held up by the gases thereof. At the bottom of tank No. 1 a carbonaceous sediment gradually, but slowly, accumulates, and may occasionally be removed. The liquid sewage in tank No. 2 contains the ammonia gases, either free or combined as ammonium carbonate. From this tank to the extent of its whole contents, whether 50 or 1,000 gallons, is discharged by an automatic flushing valve, (c) when the tank fills to any level while the adjustable float (c^1) is set as required. Syphons especially made for different depths of tank are equally available for this purpose. The effluent passes into a series of field tiles (d) carefully laid on a level some ten inches beneath the surface of the ground, exactly sufficient in number to hold the amount of sewage discharged. Fresh air is constantly supplied through the inlet, (e) which not only assists bacterial growth, but being colder causes an upward movement of cases through the house soil pipe. The tanks may be entered by manholes (G) and the double cover of tank may, if it be found necessary to prevent odors, be covered with soil or sodded with loam if the location be in a cultivated garden.

The extent to which this system may be utilized can be understood when it is seen that with carefully prepared levels a series of terraces may be arranged, each having its series of pipes on successive levels, supplied from a single main carrier, in which the sewage passes from terrace to terrace, by small wells at the edge of each, this enabling the field tiles to be kept near the surface.

It is of course apparent that as the nature of soil varies, it is desirable, if possible, to utilize sandy or porous soils ; but in experience it is found that with frequent deeper sub-soil drains at a depth of three feet, even clay soils prove amply sufficient for ordinary houses. It may happen, as in Muskoka, that a house is placed on a rocky site and no land near by is available. In such instance it becomes necessary to make an artificial sand or fine gravel filter, beneath which the field tiles are laid. This, in several instances, has proved quite satisfactory.

What seems most desirable is that the local Boards of Health should become better informed on these methods of disposing of the liquid refuse or sewage from houses, stables, slaughter houses, cheese factories and other manufactories, since, in our experience every year, a large amount of correspondence with the Board takes place regarding effluvium nuisances and pollution of well waters, which could be wholly avoided if such a system were in use. The distribution of a special pamphlet on this subject would seem especially demanded.

THE AMERICAN INSTITUTE OF ARCHITECTS.

The able address of Mr. Robert Peabody, President of the American Institute of Architects delivered at the opening of the recent annual convention in Buffalo, contains many valuable suggestions for the guidance of that body and its individual members as well as architectural societies and architects everywhere. Lack of space prevents its full publication, but a few of the principal points developed may profitably be noted. The necessity of making proper preparations to meet the demand for a high standard of artistic work, consequent upon the growing wealth of the nation, was referred to. To this end the association of a number of architects together in practice was commended as a better than the individual method.

The advance in architectural education was noted as being another important step in the direction of producing a class of architects fitted to meet the demands of the present and future. The education necessary to this purpose could best be obtained in the most perfectly organized architectural schools, and the duty of the Institute was to foster the work of these institutions. The founding of a prize in charge of the Institute for competion among graduates of these schools was suggested.

The value of draughtmen's clubs as a means of education, and as feeders to the Institute was dwelt upon. Under this head Mr. Peabody said :—" I suggest referring to a committee the question whether an alliance cannot be made either with the Architectural League of America or an association like it which might become the instrument of the draughtsmen and younger architects. I would make it the centre for classes and club life from which the older members, as they recognize that their turn is past, would naturally graduate to the Institute. To their hands, when the proper time comes, we should gladly bequeath the American Institute. If, to-day, our youths are apt to think that in this or that case the duties of the Institute have not been properly performed, it will be their turn then, and I trust that they will do far better than their predecessors, who had no Architectural Leagues in which to prepare themselves for their work." The address closed with the following reference to the work of the Institute : " We can only measure the amount of good the Institute has done by its output. Many a man who cares little for it benefits because others have cared. Many a man outside of our numbers is more respected in his community and has a more certain livelihood because the Institute has proved itself a reasonable public body. Certainly, through its influence, the perils and hardships of competitions have been greatly mitigated. But all these are small and selfish ends. The real value of the Institute lies in its opportunities, in its openings for useful work and mutual high endeavor. Thanks to the wisdom of its founders, I think it has been a potent means of good. Thanks to them, it has none of the features of a selfish trade union. In a trade union a man's powers and skill are handicapped for the general good ; but with us a member has entered into no engagements of any kind except that he will honorably practise his profession. Our compact is rather that of the ancient guilds, into which no one could enter who was not a master workman. We seek to make membership a sign of established character. We are trying to make it impossible for anybody to be an Associate who has not thus established a name for honorable professional conduct, and for no one to be a Fellow who has not done really distinguished work. With the coming year, entrance to the Institute will be possible only through examination arranged by the Institute, or on presentation of a degree from an accredited School of Architecture. I believe that the new tests will cause large additions to our numbers, because Associate membership henceforth is to mean that a definite and valuable standard of skill has been reached, and that from among this membership their comrades are to choose by honorable election the Fellows of the American Institute of Architects. To many young men these will, I doubt not, seem valuable inducements."

TORONTO ENGINEERS' CLUB.

At the regular meeting of the Engineers' Club of Toronto on October 1st, the topic for discussion was " Parks, Squares and Drives for the City of Toronto." It was expected that Mr. Cecil B. Smith would introduce the subject, but owing to business engagements he was unable to be present. The president, Mr. Hertzburg, expressed his interest in the subject, and referred to the plan proposed by the Guild of Civic Art, which was that some general scheme should be followed in future in the laying out of public parks and streets. He was in favor of diagonal streets. Mr. Spry did not think that Toronto was capable of much beautifying, as it was laid out on an ugly plan. He thought one of the greatest drawbacks was the impossibility of obtaining a good view of even the largest buildings in the city. Neither were there any suitable sites on which to place statues or anything of that kind. Mr. Chipman said that it would be very expensive to open cross streets, but that this might be kept in view in future extensions. The improvement of the harbor was referred to, the consensus of opinion being that it would be difficult to carry out any plan of improvement unless at considerable expense. Mr. Spry advocated the concentration of all heavy freight at one end of the harbor. Mr. A. B. Lambe said that in his opinion it was a question of beauty versus utility. He did not think the commercial interests should give way to parks and squares. The advisability of placing the sidewalk next the curb was discussed, opinion being about equally divided. Finally a resolution was unanimously adopted approving of the suggestion of the Guild of Civic Art that in the laying out of future streets and squares a general plan, which would eventually produce an artistic and harmonious result, should be adopted.

CANADIAN ART.

The Pan-American Exposition has brought conspicuously to public attention a phase of American art that has been developing slowly and surely, but without so much as a passing notice of its existence. I mean the work of Canadian artists.

The art exhibition of the provinces in the Albright galleries is not extensive—only forty-nine artists are represented by eighty pictures—but the collection is eclectic in the best sense of the term, and it is thoroughly representative of the best efforts of the Canadian painters. Fully half the contributors are connected with the Royal Canadian Academy, whose members, through their officers, Robert Harris, G. A. Reid, M. Matthews, and James Smith, have taken a commendable pride in showing the highclass of work now being done in their country.

We, in the United States, with our larger and broader art interests, are apt to overlook, and perhaps even disparage, the art products of the Canadian provinces. Many readers, doubtless, do not even know that there is such an institution as the Royal Canadian Academy, and those who know of its existence perhaps fail to realize that in the measure of its opportunities this institution is striving zealously to stimulate and broaden the art spirit in Canada and to promote every form of art interest.

That the work of the Academy is attended by difficulties and discouragements is frankly admitted by the officers of the institution. It is chiefly in the provinces of Ontario and Quebec that one can speak of an art spirit at all. Many of the best artists of these provinces have of recent years left the country, lured by what they thought were the brighter prospects offered by the populous cities of the United States. The market for high-class work in oil and watercolors in Canada is narrowly circumscribed, and as a consequence there has been a tendency for years toward the depletion of Canadian studios. The artists move away and soon are utterly lost to their country, since change of residence has in most cases involved the assumption of new allegiance, the artist claiming little more than Canadian birth.

The same is true of those who have made illustration a specialty. The publishing interests of the provinces are meager and can give but scant employment to promising men. In consequence there are probably fewer competent artists in Canada to-day than there were a decade ago.

Canadian artists have the same complaint as their American confreres, that the collectors and connoisseurs of their own country, who spend thousands of dollars annually in works of art, are prone to slight native talent and devote their money to the purchase of Old World products by recognized masters. This, however, is less surprising than in the case of artists of the United States. As was recently pointed out by one of the closest observers of Canadian art interests —and a Canadian himself—it is only of recent years that the art of Canada has passed beyond the production of fairly well executed water-colors depicting still-life subjects or topographically correct bits of landscape.

It is not to be overlooked—and the fact should be noted in justice to the public—that those Canadian collectors who have expended large sums for foreign art works have felt a sense of obligation to foster home talent and have been the most liberal patrons of the colonies. In a word, Canada has been in the position of most colonies the world over. It has received slight and patronizing recognition from Englishmen in general, and virtually no recognition from the residents of other countries. Under these circumstances, it is somewhat surprising that native artists have made

such satisfactory progress. In reviewing the development of Canadian art during the last decade, M. L. Fairbairn said recently :

"Our national art institution, the Royal Canadian Academy, during these ten years has pursued the even tenor of its way, filling the vacancies made by death or removal, holding its yearly festival, staid, respectable, slowly progressive, adding to the permanent collection in Ottawa the diploma of its new members. The number of exhibits each year has not increased, because in former times each academician was entitled to have twenty pictures hung, no matter what their merits, so the walls were always covered. The number has since been reduced to ten, and later to eight. The standard for the works of outsiders has been raised, so that with fewer pictures the exhibitions are better."

The same characteristics that Mr. Fairbairn speaks of as obtaining in the last Canadian exhibition are observable in the exhibit at the Pan-American. Canadian painters have been brought under the influence of all the art influences of recent times. This is partly due to the fact many of them have received instructions from masters in leading schools outside their own country and partly to the practice of importing and

Canadian Art Exhibit.—Pan-American Exposition.

exhibiting in the leading cities of the provinces examples of the best work of American and European artists. Canadian artists have thus fallen into line in all new movements, following instead of leading, it is true, but nevertheless giving evidence of an alertness to what is going on in the art world to-day and a desire and a capacity to profit by the examples which they have not yet been able to set.

This is conspicuously shown in the work of the various art schools throughout the provinces. These schools are increasing in number and efficiency, and they find an able auxiliary in the Women's Art Association, which has developed with remarkable rapidity during recent years, and which now has branches in a number of the leading cities throughout the provinces of Ontario and Quebec.

Interest in the art work of the better known schools is also markedly advanced by the development of an arts and crafts movement in Canada. Lovers of the beautiful were not slow to take inspiration from William Morris, who sought to apply art to the requirements of daily life. The direct result of Morris's influence has been to impel Canadian artists to supply designs for the manufacturers of their own country and to inaugurate various exhibitions of applied art and design. A higher standard of taste has thus been developed as regards both fine and applied art, and this higher standard of public taste, for which the artists themselves are responsible, has reacted upon themselves and of necessity impelled them to higher attainments.

The Canadian art exhibition at the Pan-American shows the fruits of this healthful condition of affairs. Of the eighty pictures displayed, many are of an exceptionally high quality, showing broad, truthful treatment and mastery of technique. William Brymner shows three charming water-colors, two of which, "The Gray Girl" and "Francie," are finely executed figure-studies. "The Gray Girl" presents a little miss in the attitude of writing, and "Francie," portrays a sunny-haired child standing in natural posture against a dull gray background. In both pictures the color scheme is low-toned, harmonious and eminently pleasing. F. M. Bell-Smith also displays three characteristic pictures, "London Bridge," "Strawberry Pickers" and "Above the Clouds." These show a wide range of interests, and a capacity for different types of work that augurs well for the future of the artist.

J L. Graham's three pictures, "Dinner-time in a Stable," "Ploughing," and "Carting Sand," show a marked ability to invest homely scenes with poetic character. His "Carting Sand" depicting two horses pulling a load over a heavy road, with a couple of countrymen walking beside the wagon, is an especially worthy interpretation of country life. Robert Harris, president of the Royal Canadian Academy, who won a medal at the Chicago exhibition. and also an honorable mention at the Paris International Exhibition a year ago, exhibits two fine portraits of women, suggestive of a close study of Gainsborough.

In the line of portraiture, E. Dyonnet, E. Wyly Grier, who took a third medal at the Paris salon, A. D. Patterson and G. A. Reid also exhibit fine canvases, which betray a delicate palette and a firm grasp on the essentials of good portraiture, "The Beach of St. Malo," by James Wilson Morrice, is especially pleasing in tone and subject, as is also "Girl Knitting," by Laura Muntz, in which sunlight effect is most admirably depicted.

G. A. Reid, also a medallist at the Chicago Columbian Exposition, exhibits a choice decorative panel, "Summer"; F. M. Knowles, two fine picteres of the Thames River and an equally choice canvas, "The Last Load"; William Cruickshank and F. S. Challener, familiar farm scenes ; M. A. Bell and John Hammond, marines ; and H. Blair Bruce, a dainty canvas depicting nude maidens sporting on a moon-lit beach.

Other canvases are no less worthy of mention, and space alone forbids further specific mention. Suffice it to say that W. E. Atkinson, J. A. Brown, Henri Beau, W. D. Blatchly, F. H. Bridgen, Maurice Cullen, Florence Carlyle, J. W. Forster, J. C. Franchere, R. F. Gagen, C. S. Haggerty, Homer R. Watson, Mrs. Mary Heister Reid, Edmund Morris, C. J. Wray, F. A. Verner, William Hope, M. Matthews, and other leading artists of the provinces are represented by pictures ranging from still-life to landscape, and from portraiture to genre subjects. These pictures do not suffer by comparison with the work of other American artists.—Katherine V. McHenry in Brush and Pencil.

ONTARIO ASSOCIATION OF ARCHITECTS.

The Toronto Chapter of Architects have arranged with the authorities of the Toronto public library to allow books from the valuable collection of architectural works in the library to be placed on the tables in the Association Rooms on Tuesdays, so that they may be inspected by architects attending the weekly luncheons.

A CANADIAN ARCHITECT IN KOREA.

The friends of Mr. H. B. Gordon, of the firm of Gordon & Helliwell, architects, Toronto, who left Toronto in June last for a temporary residence in Korea, will be pleased to learn of his safe arrival and good health. Korea, as our readers are aware, is a peninsula jutting out from the northern part of China. The capital, in which Mr. Gordon makes his headquarters, is Seoul. Here is the centre of the missionary work in Korea, conducted by the American Presbyterian Missionary Society, in whose employ Mr. Gordon is at present, having been commissioned to design and superintend the erection of a number of buildings for the Society, including a hospital and houses for the missionaries. Mr. Gordon writes that sketches of several of these buildings have already been prepared, but not finally approved. He is at present in China in connection with proposed improvements to the Society's property there. Of the native architecture of Korea, as represented by the hotel in which he is quartered, Mr. Gordon writes as follows :—

"The hotel is a one story Korean gentleman's house built in Korean style. The compound is enclosed by a wall and has a gate house—nothing very stylish. The buildings consist of the main part built around a court or garden and the servants' quarters built out separately. The walls are a strong frame resting on stone work, and the spaces in frame filled in with 4½ inch brickwork in two colors, viz., red and dark grey. The roof is the strangest and strongest combination of posts and large beams, with rafters made of round beams, covered with small pieces of wood and about 6 ins. to 1 foot of mud, and then roofed with tiles. The spaces between the rafters and the inside walls are plastered and then the whole thing papered. The house looks quite picturesque from the outside and very quaint within. There are very few two story buildings here, except the foreign houses and the palaces. It is not considered etiquette for a common man to live in a two story house."

KING ALFRED WAS AN ARCHITECT.

The Manchester Society of Architects have presented to the Free Reference Library of that city a chaplet to be hung below the statue of King Alfred, accompanied by the following explanatory notes by the president : "It is not generally known, perhaps, that King Alfred was an architect. William of Malmsbury, in his 'Chronicles,' speaks of him as 'not only a lawyer, uler, mathematican and poet, but also a complete architect.' Of course we know that he rebuilt London, and also really built the towns of Winchester and Dorchester. He was, in fact, a real architect as well as a great many other things. It struck me, as President of the Manchester Society of Architects, that it would be a nice thing to honour his memory, and the society has sent the chaplet, which is made of laurels to indicate his victorious character, and white flowers to indicate his high morality. The society declared that the chaplet should be accompanied by the statement that it was from the President of the Manchester Society of Architects as a token of high respect for the memory of the great monarch, who was the pioneer of English architecture."

A correspondent writing from the newly opened district of Temiscaming in Northern Ontario, states that deposits of a peculiar blue clay have been discovered suitable for brick making, as well of clay specially adapted to the manufacture of pottery and sewer pipe. It is said that capital is being raised with which to establish a pottery.

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Contributions of value to the persons in whose interest this journal is published are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

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BOOKKEEPING FOR JOINT STOCK COMPANIES.—A practical and comprehensive treatise on the organization forms and bookkeeping entries required to meet the varying conditions of Joint Stock Companies of all kinds, together with an analysis of the Dominion and Ontario Acts governing such corporation, by David Hoskins, Chartered Accountant, Principal of British American Business College, Toronto, and Vice-President of the Institute of Chartered Accountants of Ontario. Published by the Federated Business Colleges of Ontario, Limited, Toronto, Price, $1.50.

The author of this work has, we are pleased to see, avoided the error into which most writers of bookkeeping texts have fallen, namely, that of arranging the matter in such a way as to necessitate a large amount of mechanical work being performed before any practical benefits can be obtained; on the contrary, his explanations are so clear and concise and so excellently indexed that the busiest of men can obtain full information on any of the many technical points of joint stock company bookkeeping or law, in a surprisingly short time. The whole subject has been treated in a thoroughly practical and business-like manner and shows a masterful grasp of the entire range of company accounting. The chapters dealing with the conversion of business concerns into Limited companies and the Amalgamation of Companies are particularly good ones, while the many illustrations of Financial Statements used by the leading Canadian mercantile and manufacturing institutions cannot fail to be of great value both to the business man and the accountancy student. A first-class idea, in this book is that of including the questions set on the examinations of the Institute of Chartered Accountants of Ontario. Mr. Hoskins is to be congratulated on his important addition to accountancy literature.

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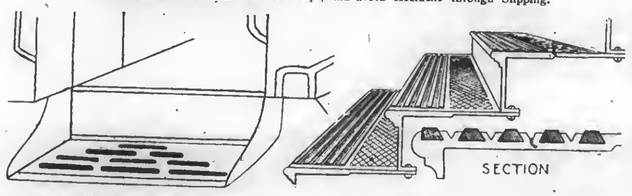

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Contracts aggregating about $11,000,000 for construction work on the buildings and grounds of the Louisiana Purchase Exposition will be awarded about December 1. About $7,000,000 of this amount will be expended on the buildings and about $4,000,000 on the grounds. The first contracts to be let will be for the four big exhibit buildings which, with their surroundings, will, it is estimated, cost about $4,000,000. The main buildings will be larger than those of any previous exposition in Europe or America. Some will exceed similar buildings at former expositions by over 25 per cent.

Official intimation has just reached Mr. Edwin O. Sachs, chairman of the British Fire Prevention Committee, that a large silver portrait medal accorded by Her Majesty, the German Empress, in connection with the Fire Congress in June last, has been presented to the Executive of the Committee as a mark of appreciation for the services rendered by that body in the demonstration of scientific and economic aspects of fire protection. It will be remembered that a deputation of the committee comprising Mr. Edwin O. Sachs, (chairman), Mr. Ellis Marsland, Mr. F. R. Farrow, and C. E. Goad, accompanied by the secretary and engineer, visited Berlin in the summer, and that an important exhibit of technical models and photographs was loaned to the German authorities for the exhibition held in connection with the Congress.

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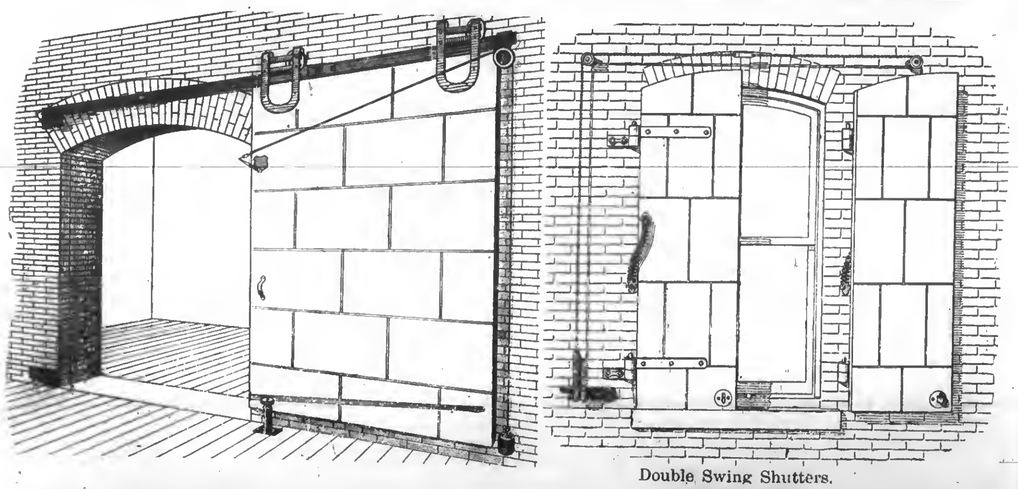

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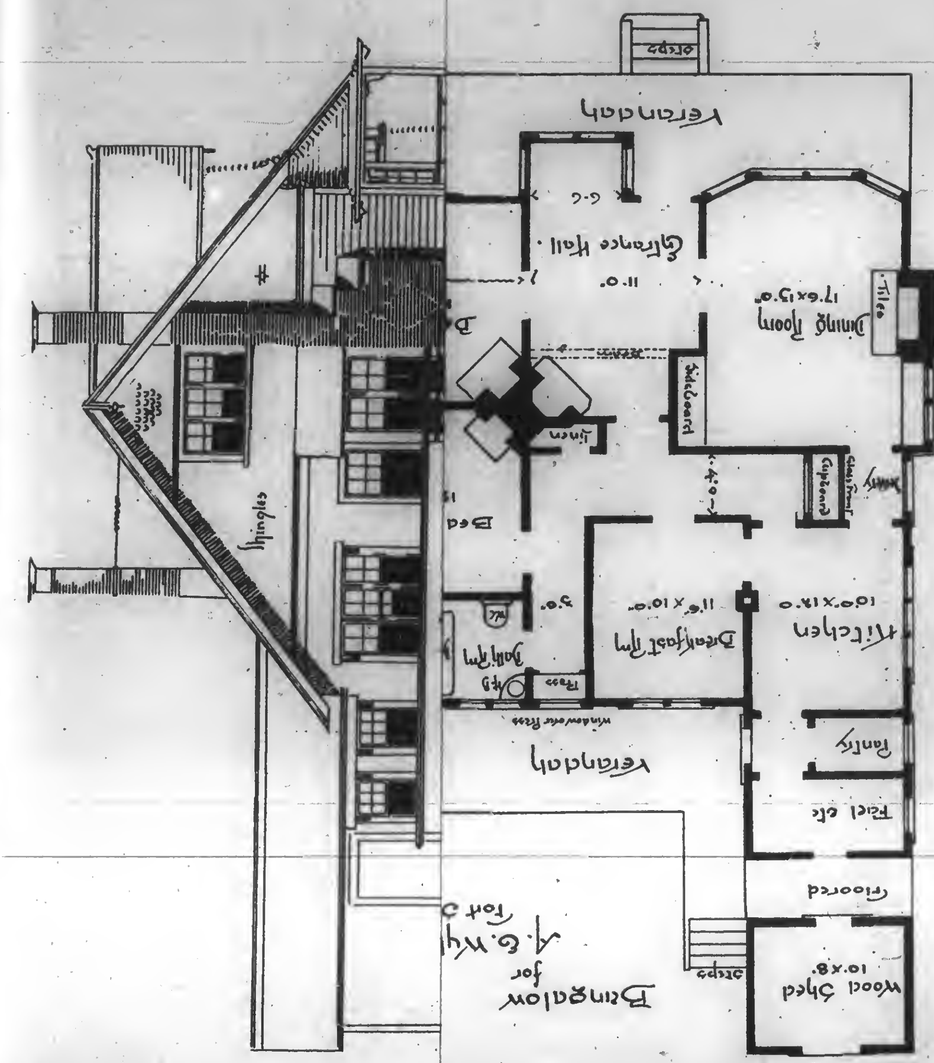

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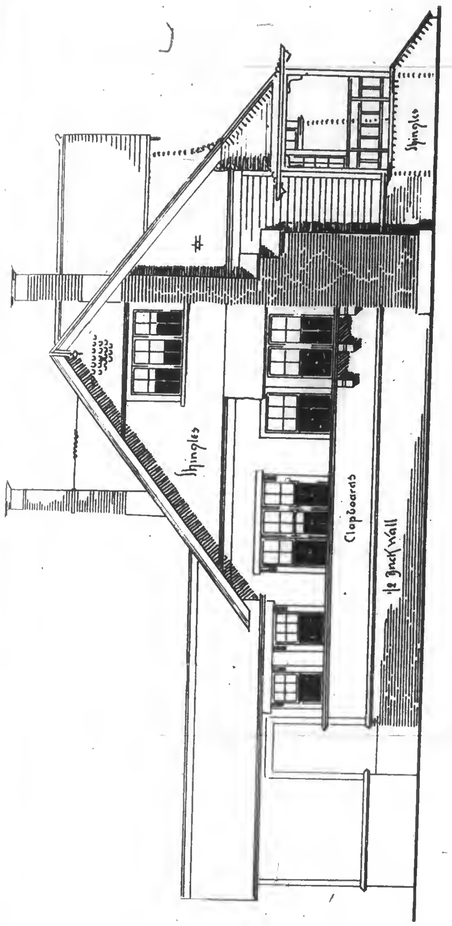

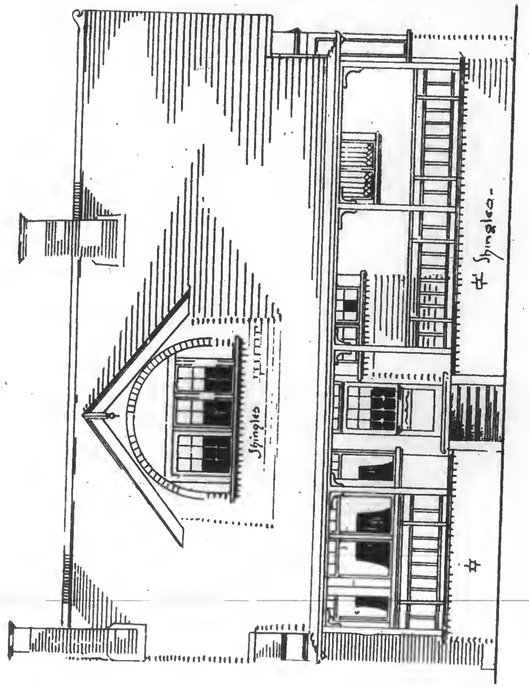

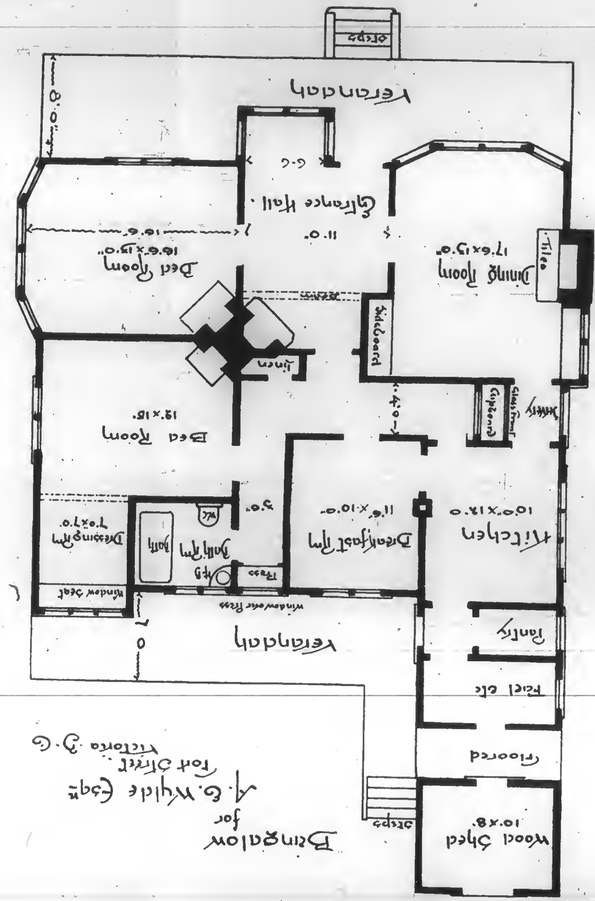

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OCTOBER, 1901

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ROBERT FINDLAY, ARCHT. W. HILL, SCULPTOR.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
OCTOBER, 1901

THE DOMINION BANK, WINNIPEG, MAN.
MESSRS. DARLING & PEARSON, ARCHITECTS.

KIRBY HALL.—SOUTH SIDE OF COURTYARD.

The Canadian Architect and Builder

VOL. XIV.—No. 167. NOVEMBER, 1901.

ILLUSTRATIONS ON SHEET.

Residence, Toronto.—Messrs. Symons & Rae, Architects.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

House in Rosedale, Toronto.—Mr. A. Frank Wickson, Architect.
Town Hall, Windsor, N. S.—Messrs. Elliott & Hopson, Architects.
Photogravure Plate.—Canadian Bank of Commerce, Winnipeg, Man.—Messrs. Darling & Pearson, Architects.
Photogravure Plate.—Kirby Hall, North Side of Courtyard.

CONTENTS

Editorial	181-182	Unsafe Projections	188
Notes of a Visit to Boston and New York	183-184	Steel vs. Cast-Iron Stanchion	188
By the Way	184-185	Ideals in Architecture	188, 189, 190
The Necessity of Care in Excavating	185	Fresco Painting in Italy	190
Toronto Engineers' Club	185	Progress of Manufacture of Stained Glass	191
Ontario Association of Architects	185	Correspondence	191
Preservation of Steel Structures	186	Students' Dept.	VII.
Architects and Engineers in Building Construction	187	Recession in Rooms	XI.

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Safety of Elevators. An elevator in one of the principal office buildings in Toronto, dropped twelve or fifteen feet the other day. The suspension cables became detached from their fastenings at the top of the shaft and fell in a heap on the cage. The passengers fortunately escaped injury, but as may be imagined, were badly frightened. Rumors are abroad of similar happenings at some of the great departmental stores of which no mention has appeared in the papers. A system of elevator inspection is supposed to be in force in Toronto, but these accidents would seem to indicate that its efficiency might and should be improved.

Methods of Designating Floors. So much confusion exists regarding the order in which the different floors of a building should be named that some leading Canadian architects have decided to fall in line with American practice and the ideas of the majority of their clients by numbering the different floors one, two, three, etc., beginning with the ground floor as number one. The practice here and in England has been to name as the first floor the one first above the ground floor. It is claimed, however, that probably 75 per cent. of architects' clients regard the ground floor as being the first floor. The result is frequent misunderstandings between architects and clients, requiring frequent explanations, and leading to delays where matters have to be arranged by correspondence. It is thought by some that the difficulty would be overcome by adopting the American instead of the English method. Where there are basements, the floor would be designated as the "basement floor," and the floor above as the "first floor," counting from the fron of the building. Local architects are by no means unanimous in opinion regarding the advisability of changing the method which has been in vogue until the present. The subject is an interesting one and of considerable importance to the profession, and might profitably receive discussian at the Annual Conventions of the Architectural Societies.

Workmen's Compensation Acts. The Workkmen's Compensation Acts of Canada, fashioned after the law of Great Britain, are found to be not less difficult of interpretation. In Great Britain all sorts of interpretations have been given by the Judges of the various courts, resulting in such a legal muddle, that there appears to be no certainty in the mind of anybody as to what an employer's liability under the act really is. As evidence that the meaning of the Canadian law is equally obscure, it might he mentioned that the partners of a well-known legal firm not long ago spent half a day in discussing the interpretation of a particular clause. Much unnecessary litigation as well as injustice seems certain to be the result of the operation of this important law simply because proper care was not exercised in its construction.

The Designing of Factories. Architects and persons interested in architecture outside of the profession, will rejoice to observe the more or less successful attempts that are being made to give a character and interest to the design of factory buildings. Such buildings need not necessarily look like huge packing boxes. They may be well adapted to their purpose,

and kept within moderate cost, while at the same time showing character in design which will make them attractive and interesting to the beholder. In striving to secure this result, however, architects should be careful to see that the purpose which the building is intended to serve is expressed in the design. No doubt the reader has seen, as we have, factories which looked like public libraries and water works, pumping stations that had the appearance of banks.

A Prosperous Season. The building season now drawing to a close has in most localities, and particularly in Toronto, been marked by unusual activity. From Winnipeg in the west to Sydney in the east, building improvement has been advancing rapidly and on a large scale. This activity is the reflex of the commercial prosperity which is at present everywhere visible, and which it is gratifying to know shows no signs of abatement. The building industry, which so intimately depends upon sound financial conditions, seems likely to enjoy a further period of prosperity. The rapid growth of our manufacturing industries has necessitated the erection of many new factories throughout the country, and these have resulted in improvements in other directions. For example, as the result of the introduction of beet growing and beet sugar factories, land in some towns in Western Ontario is reported to have doubled in price, and many new buildings will be the outcome of the increased stimulus which these towns have received. In Toronto, in addition to the large new hotel on King street, several new banks and insurance buildings have been erected and a large amount of residency work of good character has been done. With few exceptions the architects have had their hands full of work, and in some instances have found great difficulty in procuring office assistants, which, as already stated, indicates that the season has been an unusually busy one all over the Dominion and continent. The increase of population in Toronto has wiped out the effects of the overbuilding done a few years ago, so that houses are in steady and urgent demand. Desirable office accommodation is also at a premium, and the coming year is likely to witness the erection of one or more large office buildings.

Heating Methods. Great improvements have been effected in recent years in apparatus and methods of heating buildings. By means of various present day systems it is possible to maintain an equable temperature of say 70 degrees throughout all parts of a building with the outside temperature at zero, thus ensuring a high degree of comfort in winter even in a cold climate. The ideal condition will not have been reached, however, while coal continues to be employed as fuel, involving as it does so much labor. The inroads which electricity has made as a competitor of gas for interior lighting, has induced the gas companies to encourage the use of gas for cooking purposes. So profitable have been the results in this direction that the loss of a large lighting business is regarded with a degree of complacency. It is to be hoped that the gas companies will go a step further and furnish the means whereby gas could be used instead of coal for the heating of buildings. At present every building is a gas works on a small scale, having in the basement a furnace and system of pipes and a pile of coal with which to produce heat. How much better it would be to have the gas produced and supplied ready for use from a central station, as in the case of illuminating gas. In view of the constant reduction in demand for illuminating gas, it may eventually be that the gas companies will supply gas of a lower grade for heating and cooking purposes, which by means of apparatus on the premises can be so enriched as to be also adapted for lighting when required.

The Commercial Age Commercialism is stamped upon almost everything to-day, This age will probably be known in history as the Commercial Age. The people generally are so engrossed in money-making that the accomplishment of great things in other lines is scarcely to be expected. Almost every article used or worn is made by machinery, much of it by automatic machinery designed to produce the greatest quantity with the least expenditure of time and cost. The occupation of the skilled workman is to a large extent gone. Young men with original ability to make good carpenters are put to feed a machine, and as a natural result in time themselves become machines without the ability to devise or execute any work requiring the use of either brains or skill. May we not expect that after two or three generations of such men shall have passed the standard of intelligence and ability will have sunk to a deplorable level? Already complaint is heard from architects and builders of the difficulty of securing skilled workmen capable of doing the finer and more important features of their work. One after another the older workmen trained in Europe are dropping out of the ranks, and none are found qualified to succeed them. Opportunity is no longer afforded youths of acquiring knowledge of a trade. In the shops and factories of to-day the work is specialized to the greatest possible degree, and machinery employed wherever possible. Everything is sacrificed to cheapness of production and individuality, ambition and skill on the part of the workman finds little encouragement. Is it any wonder that there is so much that is not genuine in the construction and finishing of modern buildings? The stores are filled with shoddy goods; for example furniture, which is a cheap and nasty imitation of honest wood and covering which could not be sold for double the price. The taste of the masses of the people is being perverted, and they are encouraged by means of these cheap and showy wares to enter into foolish and ridiculous competition in mode of living with their neighbors and people with larger resources. Out of this competition has sprung the instalment plan stores, which are the worst offenders against frugal and common-sense living. It is undoubtedly true that the cheapened cost of production of many articles due to the increased use of labor-saving machinery has placed these articles within reach of and added to the comfort of the masses. Against this, however, must be placed the degeneracy of the artizan and the perversion of taste already referred to.

Mr. Andrew Carnegie is said to have given away up to date the sum of $11,254,500 towards the erection of public libraries.

The funny man of the Toronto Star rises to remark that those new elevators in the parliament building will be used when they wish to give a measure the six months' hoist.

Mr. Thos. M. Morgan, whose cement works at Longue Point, Que., were recently damaged by fire, claims that the concrete walls built two years ago came out of the fire almost intact.

NOTES OF A VISIT TO BOSTON AND NEW YORK.

My journey had no professional motive; but, where there are so many good buildings, one cannot fail to have noticed something worth reporting in notes such as the Editor wishes me to make.

I broke the journey at Albany both going and returning. Besides other reasons, there are two points about Albany that make it interesting to a Toronto person. It is situated on a hill and it is built in rows. To sit at breakfast in my hotel and look out upon a steeply ascending street, with all the variation that this implies in base and sky lines, was in itself a treat to one accustomed to see everything on a dead level, but in the streets themselves, closed at the bottom with a view of the hills across the Hudson and crowned with the State Capitol, the beauty of a city set on a hill was still more apparent. As to buildings in rows, I must confess to a liking for it. A city is a city when it is built solid, and dignity is so much more easily attained. When there is only one front, the expense of good material is compassable. Even with plain material success is easy. Then the convenience! There are no distances. The best residences are from five to ten minutes from the shops, and the best shops are all together in a block or two. One can do in Albany in less than an hour what would take a morning to accomplish in Toronto. The Capitol is five minutes from the railway station, the Park fifteen; there is nothing beyond, and one includes the shops on the way to the Capitol. Yet Albany has a population of 95,000. So much for compactness in a city.

This note is not without application in a city which, like Toronto has grown so far beyond the limits of convenience that a consolidation of residences within the region of the Belt Line would be a great gain.

There are many interesting things in Albany. The Capitol and City Hall are well-known, but one hears less of the cathedral; yet it will probably, when complete, hold its own in point of design with either of these buildings and is far more interesting both from its nature and as a remarkable example of how to build a large church that cannot be completed in one generation. It has been usual to build one end, the chancel or little more—to put up, with contracted floor space, that is to say, and spend resources in completing it vertically. Bishop Doane has adopted the more satisfactory plan of enclosing his whole floor area and limiting his building in height. It sounds unpleasing, but is carried out so that there is no sense of loss in height. The stonework is complete up to the sill course of the triforium. The triforium wall will be double, consisting of an inner half of stone to show in the church, and an outer half of brick, which will be hidden in the aisle roof. This latter portion is built now and, by putting the temporary aisle roof below it instead of above it, the brick triforium wall is converted into a temporary clerestory of brick. From this the temporary roof of rough timber springs, as the vaulting will ultimately spring; and, as the lines of the roof follow very much the lines the vaulting will take, and the roof rises to the same height, the proportions of the interior are perfect now. This is the principal thing. The eye is satisfied with a sense of sufficient height, without desiring to penetrate the comparative gloom of the roof. At its natural level all is complete: carving stained glass, stone pulpit, wrought iron screen, choir stalls, altar and reredos. And, what is more important than these details, the plan is complete; so that the whole effect of aisle and ambulatory arcades with their pillars, (seven feet across the greatest diameter) is there. There can hardly be a nobler church in the country, although there is work yet to be done which is estimated at over $300,000.

The way in which the work has been done is also instructive. A church building is especially susceptible of division into parts and of estimation by parts. By subdivision of the work in this way every pillar, column, window' portal, and of course the furnishings and accessories, have been provided by separate hands, by gift or collection of the cost and many Albany families have in this way become provided with an enduring memorial, duly carved upon the stone as a portion of its decoration. A list of the remaining works hangs in the porch, with the estimated cost set opposite, so that anyone, who has money to give or to bequeath, can take his choice of works, ranging in cost from $1,500 for a buttress to $70,000 for the towers and spire

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Boston is a beautiful city; there is no doubt about that. It always had beautiful suburbs and a beautiful nucleus, in the Common; now they have connected the suburbs with the Common by continuous drives; all of which is well known to the readers of this journal. But what struck us as an extra to our expectations was the extreme neatness of everything. This was an essential part of the city's beauty, and an aim in this direction has evidently got to go hand in hand with the aspirations, of which we usually hear most, in the direction of parks and squares and statues. New York is squalid beside Boston, because of its dirt. Fifth avenue was filthy. There may be extenuating circumstances in the near neighborhood of the excavations for the Fourth avenue subway; but whether regarded as temporary or permanent, the untidiness of the streets detracted very much from one's sense of pleasure in viewing the buildings. A city is very like a horse, it must be well groomed to look its best.

Another essential part of the beauty of Boston is the absence of vulgar bustle. Once upon a time there was a continuous procession of street cars along two sides of the Common. Now there is not a street car to be seen in that neighborhood; yet, by entering a small, unobtrusive building at the corner of the Common next to the business streets; and going down a flight of steps, one can take his choice of direction. Cars for all parts of the city, which have already discharged at another platform, draw up for passengers and depart continuously. In the streets above there is peace and quietness; and this is another important factor in the beauty of Boston. The "City Beautiful" cannot have tram cars moving through its streets.

Boston has an additional advantage in the way in which its districts are massed, so that business has one solid quarter to itself, and beauty, as represented by the best residences, another. And the outer fringe of the residence quarter is in touch with the park system, so that the rich suburban resident can drive all the way from home to within a block or so of his place of business without mingling with commercial traffic. It is partly on this account that one receives so unbroken an impression of Boston as a beautiful city. When we took a trip into the old town to see Christ church—one of those delusive investigations of historical scenes,

by which the picture of the imagination, true in conception however unlike in minor details, is forever dissipated by an intrusive recollection of the present scene, to which time has usually brought a change which is at variance with its former state. In the case of Salem street, Boston, along which Peter Faneuil and other distinguished colonials once went to church in silk truffles, the place now swarms with Jews, and the street seemed to be inches deep in a litter of paper. If such districts adjoined the beauty part in Boston as they do in many towns, so that one was conscious of their neighborhood, it could not but disturb the impression of elegance, which in Boston is unbroken. But it is only the English tourist who finds his way to the old town (though Christ church is well worth seeing). A person with an office near the Common, and a home in the Back Bay or the suburbs beyond, may live from one end of the year to the other, if he wishes, without contact with ugliness or uncleanness. If that is the end that is desired in the present agitation for beautiful cities, the general plan of Boston may be taken as an illustration of the truth that a city, like a house, if it is to be perfect, must have its working parts combined by themselves, and its living parts combined by themselves, as broadly as possible and in contact only where necessary.

It is remarkable how Richardson's pre-eminence has been challenged by the general advance in architecture. The solidity and excellence of workmanship, for which he was once so conspicuous, have now become ordinary, and his refinement, which was real, but in the large way—the refinement of "an oiled and curled Assyrian bull"—is surpassed, in the work of his descendants, by a refinement more in scale with modern life. In a great work like Trinity he still shows up in his greatness. It is a pity that the porch was not built at the same time as the church, when Richardson was young and developing his style, instead of when he was old (in growth if not in years) and his work was passing into the period, which comes to all original art, when development is at an end and degeneracy begins. The porch of Trinity is an offshoot, not of Richardson's growth but of his success, and more than anything in his own work resembles, though in a better way, the work of his imitators.

It is worth noting how the interior has been injured by the gloom into which it has been thrown by the use of Tiffany glass. The transmission of light appears to be a secondary consideration with the American stained glass worker. As long as the window is sufficiently translucent to show its color he seems to ask no more. The result in Trinity church is a loss greater than the gain of the windows which, from their unreligious character, is in any case doubtful.

One cannot conclude the notes of a tour in the big cities in the United States without some reference to the high development of the hotels. Bathrooms and fixed basins in connection with the bedrooms is an old story now, but still the greatest comfort. The latest invention appears to be directed to means of communication between the bedroems and the office. In one hotel we found on the wall a long list of possible requirements with a moveable pointer attached. Anybody or anything, from the manager to a glass of ice water, if one simply pointed at its name, forwith came knocking at the door. The simplest and best arrangement was a telephone in each room. One had only to "speak in an ordinary tone of voice" for what one wanted. The best of such an arrangement is the ease with which a party of travellers can communicate with one another. There is nothing to prevent an early morning explorer speaking from a telephone exchange a mile away to the rest of his party, in their bedrooms, about breakfast.

No invention will, however, make an American hotel comfortable until the one great invention has been made by which it will be made impossible for the heat to rise above a certain point. A procession of marble halls are of small comfort to the traveller as long as they are heated so that he is driven from his hotel to walk the street, a houseless wanderer.

W. A. Langton.

BY THE WAY.

I was pleased to observe the protests made in the Toronto press recently against the advertising signs which this year began to make their appearance in Muskoka. Among the offenders of good taste in this direction was a prominent Toronto jewelry firm. Every visitor to the Muskoka Lakes should join in this protest against the commercial enterprise which in the pursuit of gain would destroy the beauty of one of Nature's masterpieces. The violators should be made to feel that the placarding of this beauty spot is calculated to alienate rather than attract customers.

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The British architectural journals contain references to a series of tests of ventilating cowles by a committee of the Sanitary Institute. A singular feature in connection with these tests is the fact that they are said to be a continuation of tests made under the same authority twenty-five years ago. Why they were not completed when originally begun, and why so long a period was allowed to elapse before they were revived, are matters regarding which no explanation is given. It is also singular that even now the tests are criticized as being of little real value owing to wrong methods of procedure and the failure of the committee to include cowles and ventilators of modern design.

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Old London Bridge, around which so many historical incidents and associations linger, is to be widened by 12 feet, to accommodate the ever-growing traffic. Statistics show that more than 100,000 persons and 22,000 vehicles pass over this bridge each day. It is proposed to devote 9 feet of the extra width to the use of foot passengers. The bridge rests on the wooden piles of an older bridge, and soon after it was reared, in the 'thirties of last century, the foundations made an unequal settlement. The defect was put right, and the present architects are confident that the new burden can be safely added. The alteration is expected to occupy three years and to cost £100,000.

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In company with an architect I was examining and admiring a photograph the other day. My companion remarked that the excellent shading in the picture was largely due to the use of white paint on parts of the building. Out of this arose a conversation on the sudden revival of white paint for exteriors. This revival came as a natural accompaniment of the return to favor of the Colonial style in architecture. Its appropriateness to buildings designed in this particular style, is as clearly apparent as is its misapplication to buildings of every class. The man who paints white his gothic fronted house on the strength of the pleasing impression made upon him by the effect of white paint on the broad overhanging eaves of his neighbor's residence, will suffer a severe disappointment. Like many other good things white paint is "all right" when put in the right place, but is "all wrong" when placed otherwise. Just here comes in the difference between the trained and the untrained architect or painter—the one knows with certainty what materials and methods will secure a pleasing and satisfactory result, the other guesses at it, and misses more often than hits the mark at which he has aimed.

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Mr. Harry Hems, the well known sculptor, of Exeter, who was in South Africa last year, contributes to the British Architect some impressions of the building materials and methods in use in that country. Under this head he says :—"The bricks at Cape Town were the most rotten things I ever saw in my life, and the building, for that matter, more particularly outside the actual capital, is precisely as bad. Buildings appear to be carried up rough, cheap, and very nasty, the wretched bricks being laid in clay mortar, and then their faces slobbered over with plaster. Foundations are built of stone rubble; also with so-called mortar, which is, pure and simply, clay. Stores and large business places are carried up with the same horrible bricks just as roughly as humbler edifices, the walls afterwards being covered over with red plaster, and then pointed down to imitate proper brickwork—all artificial and a sham! There appears to be no recognised Building Act or by-laws. The municipal authorities have a few simple regulations and rules, but they are practically totally ignored. Fiar clay, I am told, is to be found on the Cape Flats and the kaolin in the Cape district, but I confess to never having seen it. On the other hand, in Natal—'the Garden Colony'——splendid red bricks are to be seen in many parts. At Pietermarizburg I was much struck with the excellence of the bricks and the capital manner in which they appear, almost invariably, to be laid. At Mafeking, in Bechuanaland, I found the bricks mostly in use to be simply sun-dried—made of a mixture much like Devonshire "cob"—and each measuring about two feet by one foot by one foot. The Post Office, for instance, at that gallant little place is built of these big unburnt bricks. As one gets farther north the cost of building materials naturally increases. At Bulawayo, at the time I refer to, fair bricks could be procured for 70s. a thousand; whilst at Gwelo, rather more than 100 miles further on towards Salisbury, the same kind of brick cost £6 a thousand."

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Scientists connected with the Dominion Department of Agriculture have been working upon what promises to be a very interesting discovery, namely, that all objects in nature are covered with a very thin coating of liquid air. It appears, according to this idea, that the walls of houses, the furniture of rooms and the ground over which persons walk are all spread over with a thin film of air in this highly concentrated state. The basis of this theory is the fact that any solid has the property of condensing upon its surface gases or the vapors of liquids, such as the water vapor of the atmosphere. If the wall of the room is touched with the finger it encounters, not the wall itself, but a film of gas that covers it. This film is not composed of one gas however, but of several, the molecules of which have adhered to the surface of the wall. In addition to the water vapor there are oxygen, nitrogen and carbonic acid gases. Taking them all together they go to make up something which would probably, if one could analyze it, be indistinguishable from liquid air. These gases, together with more or less water vapor, say the scientists compose the air of the room. The molecules are darting about in every direction, and as they come in contact with the wall some of them adhere to it. Countless numbers of them together, it is held, form the thin film described. To get rid of the thin film of liquid air, it is stated, one may employ heat, and by raising the temperature of the wall the coating of gas may be thinned gradually until it is entirely driven off.

THE NECESSITY OF CARE IN EXCAVATING.

The importance of careful work in excavating and reinforcing old foundations and preventing all chance of undermining them when disturbed is demonstrated, says the Engineering Record, by a recent accident to a building on East Thirty-fifth Street, New York. A new cellar was being carried down about 10 feet below the rubble foundations of the brick side wall of a four-storey brown stone front residence. The excavation was made up to a vertical plane in the face of the existing wall through very soft rotten stone which could be crumbled in the fingers. No sheeting or underpinning was attempted, and no support was given to the building except by some horizontal cross-braces between its side wall and the adjacent building on the next lot, reaching across the excavation, and some of them bearing against the middle of the wall between floors. The side of the excavation caved in, leaving a sloping bank with a steep angle running back several feet into the basement of the house and carrying out about 20 feet of the footing and a section of the wall above, about 10 feet high in the middle. Fortunately the wall was of such good construction that the bricks arched and carried the upper part over the opening without causing the collapse of the whole building. Pairs of long steel I-beams were immediately set as needle-beams to carry the wall above the break, and were supported on vertical wedged shores from the bottom of the excavation and on jackscrews set on longitudinal sills on the basement floor 10 feet or more back from the wall so as to be beyond the crumbling edge of the bank. The wall was thus held until underpinned.

TORONTO ENGINEERS' CLUB.

The Club has resumed its weekly luncheons and has changed the day from Saturday to Monday. At the regular meeting on December 5th a discussion will be held on "Wireless Telegraphy" introduced by Mr. T. R. Rosebrugh, of the School of Practical Science. At the meeting on the 19th of December, Mr. W. H. Tatton, Chief of the Railway Signal Service, will give a paper on "Interlocking Railway Signals."

ONTARIO ASSOCIATION OF ARCHITECTS.

A water color class has been organized under the direction of Mr. C. M. Manly, the well known water color artist. The class will meet in the Association rooms every Saturday afternoon at 2 o'clock. Quite a number of persons have already joined. The first meeting was held on the 23rd inst.

The weekly luncheons in the Association rooms every Tuesday have been successfully continuod throughout the summer, and since the close of the vacation season, the attendance has steadily increased.

PRESERVATION OF STEEL STRUCTURES.*

BY W. CHAMBERS, C.E.

In speaking of engineering structures our thoughts naturally turn to those Titanic erections spanning the rivers and estuaries round our coasts, supporting a flying freight of human life and valuable merchandise, of which the most notable example is the great Forth Bridge; and we have to bear in mind that in every steel structure, be it of lesser or greater magnitude, corrosive forces are at work to weaken and even to endanger its stability, and it may truly be said of steel that as the "force of gravity never sleeps" so "corrosion never ceases." It behoves us then to see that proper measures are adopted to counteract this evil.

The object in applying paint is twofold; first to protect, and incidentally beautify. The medium in general use, namely, white lead, in its pure state contains 70 per cent. carbonate of lead and 30 per cent. hydrate of lead, and is manufactured by subjecting metallic lead to the corrosive influence of vinegar and the fermentation of tan bark. Being frequently adulterated with carbonate and sulphate of lime, it can be tested in a simple manner by placing some of the powder on a piece of charcoal, when by applying a flame from an ordinary blowpipe, it is, if pure, soon reduced to a metallic mass; if adulterated, however it forms a black cinder-like substance, and even small quantities of an adulterant can be detected in this manner.

White lead is not a very stable body, and, when exposed to sulphurous fumes, is changed from a carbonate to sulphide of lead; and it has been proved by long experience that when mixed with oxide of zinc, it has increased durability, improved spreading power, easier working qualities, and greater permanency.

Red lead is obtained by calcining and oxidising white lead. It is of considerable specific gravity, and forms the basis of a durable paint. To test its purity it should be dissolved in dilute nitric acid, when any deleterious matter will remain as a sediment.

Ferric oxide does not take a high rank as a protective agent, although its cheapness and good colour give it an intrinsic value. One authority on oxide of iron as a pigment for coating metal says it is actually dangerous for that purpose, as it only combines with oil in a mechanical way, and is adversely affected by the sulphurous fumes from locomotive smoke. To test ferric oxide paint, a small quantity should be heated and ignited to burn off volatile matter; if the residue is placed in hydrochloric acid the ferric oxide is dissolved, leaving any solid matter as showing the extent of adulteration.

As already stated, the object in providing a covering for metal is to exclude moisture and to protect it from the atmosphere, which is always damp.

Linseed oil is a component part of ordinary paint, but cannot be used without a pigment, as when drying it becomes very porous, and under the microscope resembles the honeycomb appearance of a piece of tripe.

Raw linseed oil contains 5 to 8 per cent. water, also impurities called "mucosities," composed of vegetable albumen and mucilage, which prevent drying. The raw oil requires 5 to 6 times as long to dry as does the same oil after it has been boiled. The heat then evaporates the water, and throws down the impurities that would otherwise decay and generate acids that would attack the oil in the paint. The changes that occur when boiling linseed oil are complicated, and have not been clearly defined by chemists. We know, however, that during the boiling process, by the addition of sulphate of zinc, muscosities are thrown down to a notable amount; also that the counteracting effects of other oxidisable substances, such as umber, litharge, oxide of lead, and peroxide of manganese, when added, increase the oxygen-absorbing power of the oil. The addition of about 1 per cent. of the above elements, and injecting a current of air when boiling, evaporates the water, precipitates impurities, and evolves fumes that otherwise would become injurious to metal surfaces. Where paint is used as a protective medium several coats have to be applied, each to fill up the porosity of the previous coat.

The necessity of only employing pure pigments is manifest, as thousands of tons of deletrious matter are annually sold, such as burnt ore containing an appreciable percentage of copper salts and free sulphuric acid, such as is obtained from burning iron pyrites. To counteract their acid tendencies chalk is added, also Spanish white—which is another chalk preparation—and Spanish brown, an earthy substance, principally clay.

Other materials of a harder nature, such as silica, graphite, barytes, ground slate, brick-dust and kindred substances do not combine with the oil, and form only a mechanical mixture with it, and after its binding effect has become dissipated by atmospheric influence, nothing but dust remains, which is readily dispersed, leaving the metal wholly unprotected.

So much depends upon the proper application of any protective coating that an ill-important element is to have the surfaces, in the first instance, clean and free from rust. Where rust spots are deep seated, heat from a painter's torch should be applied, when in a few seconds the rust is converted by the heat into peroxide of iron, and can be readily dusted off. No coating of any kind will properly adhere to greasy, rusty, or dirty surfaces. These should be either burnt, to remove old or blotchy paint, or scraped and washed with soda lye to remove grease or dirt, and all mill scale carefully removed.

After repeated examination of several materials, I have ultimately found a coating that answers all modern requirements. It is dense, i.e., non-porous, elastic and durable; not affected by extreme heat, is easily applied, and presents a good, even and smooth finish. Its covering power is considerable, 1 gal. being sufficient to cover 1,000 square feet. It is known as "Carbonising Coating," and has powerful adhesive qualities that ensure absolute protection to the metal. It is unaffected by sulphur fumes, acids, and ammonia, successfully withstands high temperatures, and cannot be readily removed by abrasion.

As an indication of durability, it is being adopted by the Indian Government for the preservation of buildings exposed to the heat and damp of tropical climates. This material should prove invaluable for preserving intact such steel structures as may be carefully coated with it; also for maintaining intact the scantling of the beams and girders now largely incorporated into building construction, and so secure their durability and stability by ensuring them against rust and decay.

The great Forth Bridge has an exposed area of 145 acres, requiring 100 tons of paint to afford only one coat. When completed, three different kinds of paint were tried—one on each cantilever; and as an indication of their shortcomings as protective coatings, it is stated that 90 men are permanently engaged in scraping and painting the immense structure, and that the work cannot be done with fewer hands, thus indicating in a striking manner that the selection of a suitable protective medium is not the trivial detail that many suppose it to be.

*Abstract of a Paper read before the Belfast Engineering Association.

ARCHITECTS AND ENGINEERS IN BUILDING CONSTRUCTION.

The extent to which engineering in one branch or another has entered modern building construction is scarcely realized until one considers in detail a great modern office or other building, with its heating, lighting, ventilating and elevator machinery and the motive power required to operate it. The same observation is applicable even with greater force to a considerable class of buildings in which the development, transmission and application of power are elements of materially greater relative importance. This complicated combination of purely structural work and machinery installation has inevitably raised important questions both as to the amount of fees for the design and supervision of the entire work and the division of them between the architect and engineer. These questions are comparatively new, as it is but a few years since the design of a building involved so little outside of strictly architectural work that nothing beyond the services of the architect were needed, although in the older practice of the architect his field was considered a rather broad one. Indeed, nearly two thousand years ago Vitruvius wrote: "An architect should be ingenious and apt in the acquisition of knowledge. . . . He should be a good writer, a skilful draughtsman, versed in geometry and optics, expert at figures, acquainted with history, informed in the principles of natural and moral philosophy, somewhat of a musician, not ignorant of the sciences both of law and physic, nor of the motions, laws, and relations to each other of the heavenly bodies." And then, as if to confirm or justify the professional character of the architect, and possibly to indicate the propriety of joining the expert services of other professional men to his own, he further wrote: "Moral philosophy will teach the architect to be above meanness in his dealings and to avoid arrogance . . . and, what is of the highest importance, it will prevent avarice gaining an ascendancy over him: for he should not be occupied with the thoughts of filling his coffers, nor with the desire of grasping everything in the shape of gain, but, by the gravity of his manners, and a good character, should be careful to preserve his dignity."

The overlapping of the professional work of architects and engineers has already received serious consideration, and a committee report touching the matter, printed in the Engineering Record of December 22, 1900, was made to the last annual convention of the American Institute of Architects held in Washington, D.C. The committee made its report after a conference with a committee of the American Society of Heating and Ventilating Engineers, with many engineers of various specialties and with architects representing all sections of the country. The committee recommended in substance that the Institute's schedule charges be so amended that the minimum fee of the architect for those portions of his work involving electrical, mechanical and sanitary engineering, heating and ventilation, be made 10 per cent. of the cost of the corresponding parts of the work; that the architect select engineering experts and that the latter render their services under the supervision of the architect. On the whole, the terms of the report of the committee, when reasonably interpreted, may be considered satisfactory, and yet there would appear to be something further to be said. The Institute has not devoted serious attention to this matter any too soon, and it probably would be wise for the American Society of Civil Engineers, or for other engineering bodies, to devote to the same subject equally serious consideration. In this region of professional work architects and engineers ought to co-operate both cordially and comprehensively. Both professions are deeply concerned and the most satisfactory results can only be obtained by mutual effort. As a matter of fact, general principles of co-operation could be at least outlined which would be of material benefit in other work than building construction. It is well enough that the architect should be the responsible head in the design and construction of buildings, but it would be equally suitable and essential that if an architect co-operated with an engineer in the design and construction of a bridge, the engineer should be the responsible head. Again, it is in the highest degree essential that in work where engineers and architects co-operate both should act from the initiation of the design work. This may not be essential from all points of view, but it certainly is essential from the point of view of estimated cost, and that is a point of view which does not always receive sufficient consideration. A client has a right to know what the cost of the work will be within a narrow margin, whereas the estimated costs of buildings with the plant involved are often grossly in error. Such a result will almost certainly occur if the services of the auxiliary expert do not begin with the inception of the design. His preliminary work ought to be performed coincidently with that of the professional principal, in order that all the elements of cost may be developed suitably to the purposes of the complete design, and, so far as their principal features are concerned, in final shape.

The report of the committee of the American Institute seems to bear entirely on the matter of machinery plants or parts of the work other than those of a structural character. As a matter of fact, there may frequently arise structural questions requiring auxiliary expert services. In most cases such expert service would be rendered in connection with the design of steel-work or foundations. Obviously these features should receive the same treatment as the others of the same class—that is, those beyond the limits of a purely architectural character. Apparently it was the opinion of the committee that all such structural matters, should, so far as the fees are concerned, be considered architectural only. It may reasonably be doubted whether that is the proper conclusion. Certainly some foundation work and occasionally special structural design may properly be classed in the same category as the special lines of installation named by the committee and covered by the 10 per cent. fee. It is full time that these and possibly other fields of professional co-operation should be carefully considered by both engineers and architects, to the end that they may in actual practice be suitably recognized and that an adequate distribution of responsibility and fees may be reached. —Engineering Record.

According to the Irish Builder, the Irish oak of which the famous roof of Westminster Hall is constructed was grown in Dublin, in the vicinity of where now stands Christ's Hospital, or Blue Coat School. Centuries ago there stood here a famous oak forest. Some people say the Westminster Hall oak came from the county of Carlow, which, up to the present century, was noted for its fine oaks. In the middle ages Ireland was a great oak-growing country.

UNSAFE PROJECTIONS.

The city coroner of Manchester, England, recently called attention to the necessity for more frequent and careful inspection of balconies and other projecting features of buildings. His remarks on the subject were the outcome of an inquiry into the death of a young woman who was killed by the fall of a large stone from a balcony. Shortly before the accident the balcony had been occupied by three ladies for the purpose of viewing a procession. Examination showed that apparently there was nothing to hold the stone in position, and the wonder was that it had remained in place for a quarter of a century.

The coroner said owners of property frequently neglected to see whether balconies and other such places were in a safe or unsafe condition. They seemed to think that they would last forever, and it did not occur to them that material would wear out. The accident, he said, showed how necessary it was that buildings should be regularly inspected. If the accident had happened within a short time of the stone having been fixed in position, he would not have hesitated to have advised the jury to send the responsible person for trial on a charge of manslaughter. In this case, however, the stone had been in position for more than twenty-five years. At the same time, he added, a person ought not to be allowed to come into a court and say: "I did not know that it was dangerous." If they had examined it they would have found it out. He only wished that the law was strong enough to allow him to send some one for trial. If the jury were satisfied that it was an accident, he would take their verdict to that effect.

The building inspection in most of our cities is much less thorough than it ought to be, due in a measure to an insufficient number of inspectors, and it is extremely doubtful whether the safety of the projecting features, pediments, etc., receives any attention whatever. Yet pedestrians should as far as possible be protected from injury from this quarter.

STEEL VS. CAST-IRON STANCHIONS.

Fashion has some influence in the building trades, and brings with it a certain amount of practical imbecility says the Builders' Reporter. It is now the fashion with some architects to specify rolled steel as the material with which to build up columns and stanchions. Under some conditions this is suitable for large and very heavy structures, but for ordinary buildings it will not bear comparison with cast-iron. In the first place the strength is to be considered. The calculated ultimate strength of an English steel 9 inch by 7 inch rolled joist 7 feet high is 22·4 tons per sectional square inch, and that of a cast-iron column 7 inches in diameter is 26·5 tons per sectional square inch, which indicates that for equal carrying capacities the steel stanchion must have 18 per cent. more horizontal sectional area than the cast-iron column, and taking into consideration the difference in specific gravity the steel stanchion will be 27 per cent. heavier than the cast-iron column. It will be noticed that the same ratio of width to height has been kept in both materials. When stanchions are made of various sections rivetted together, we cannot be certain that the rivetting is sufficiently uniform to insure each part receiving its due share of the load, so that probably the strength will be less than that given above for an element in one piece; the cost per ton is from 30 to 40 per cent. more than cast-iron, so putting all things together in the most favourable form for built-up steel stanchions the cost will exceed that of cast-iron columns by about 65 per cent. This is a considerable amount for a client to pay for the ignorance of his adviser. The attachments to small built-up stanchions—brackets to take girder ends—are awkward, as the whole stress must be picked up by rivets, often in an insufficient space, whereas in the cast-iron column or stanchion there is continuous solidity throughout the work, and whatever shearing sectional area is required can be secured in a comparatively small space.

IDEALS IN ARCHITECTURE.

As we have more than once remarked, there is a growing desire on the part of those who have some authority to point the way, to plead for higher ideals in the matter of latter-day architecture. One of the most recent voices from what may be termed the "professional pulpit," is that of Mr. G. F. Bodley, A.R.A., F.S.A., who discourses in the March number of the National Review, and seeks to lay down certain principles or characteristics of good architecture. One principle is, with rare exceptions, he declares, eminently absent in modern work—the expression of a real artistic refinement. "Refinement, alike of general design and of detail, is sadly lacking in modern buildings. There is an indescribable charm, a poetry, and a sense of repose about ancient architecture that one seldom sees in later work. It is not only that the mellowing hand of Time has mysteriously wrought the effect, it is the reasonable, manly sentiment that prevades the whole animus of old architectural buildings. If I may so speak, the expression is one of greater courtesy, combined with less display and greater nicety of sentiment, than, alas, so much of our modern buildings can show. The same may be said of other works of art. The tender touch, the grace, the quiet power—how rarely we find them in modern literature or art. Certainly the voice that speaks so powerfully or so pleasantly in ancient architecture discourses in less courteous tones, or but feebly, from our modern buildings."

In the building of the present day, he goes on to declare, there is too little that we can call architecture. "Where, in our works, I would ask, are the architectural influences that would tend to educate the people? Look at any of our new towns where there is not the presence of old buildings to redeem the general aspect of ugliness and vulgarity. It is not that the houses are merely destitute of ornament; there is the presence of vulgar and ugly so-called ornament in plenty, sometimes, indeed, in heavy and tiresome profusion. The shape and proportion of the houses seem to have come by chance, and without design. The ugliest materials have been used—bricks of the poorest color, and of ungainly size, the roofs covered with cold-looking blue slates of too large dimensions, and the details of the exterior are in every respect without interest or refinement. Inside we find the same poverty or vulgarity of design everywhere. The meanness of stained deal seems to have been delighted in, or, if it could be afforded, that ugliest of all woods, "pitch pine," with its coarse grain and hot color. Color and form alike are without beauty. I am not thinking so much of those unhappy new towns amongst us which are devoted—I had almost said doomed—to manufactures and industrial works, where the sky is darkened, Nature disfigured, and the enjoyment of any art almost impossible. I am thinking rather of modern watering-places and the like—places devoted to leisure and pleasure, chosen for their brightness of climate and beauty of scenery, but presently made hideous by a very nightmare of badly designed and worse constructed buildings. In the new towns of which I speak the inhabitants live surrounded by these buildings, to the great detriment of all artistic perception. Or, look again at our London houses of a slightly older and better period. Our "long, unlovely streets" are without interest or dignity, and, with rare exceptions, a uniform dullness at best prevails. You may pass through many miles of our London streets without seeing one redeeming building, or even a part of any such building. There is a uniformity of dreary ugliness alike in Camden Town and in Belgravia. Whitechapel is better, for there are some old buildings there. Is not all this a satire on our civilization and on our culture?"

Coming to some of the principles and characteristics of architectural design, he enumerates Refinement, Concentration, True Use of Detail, Symmetry, Economy of Material, Contrast, Avoidance of Extravagance of Manner, Suitability, Harmony, Color, Work founded on that of the past, Consonance with Nature; lastly, Truth. Dealing with them in turn, Mr. Bodley affirms that refinement of design is the chief principle lacking in the present day. "What is the history of architectural art in our own land? What is the one principle that led on from century to century, from style to style, but the desire for refinement? Nature is our great guide, although we are unable to gauge her redundance of life, its variety and infinite delicacy. Now it is in the refinement of architectural work whereby this expression of life is chiefly shown. According to the material and means at command, there should be the careful exercise of artistic power if we are to bring out to the utmost the expression of life. This is a great principle of all art, and one to which limits can hardly be assigned. It should animate every detail of our architectural work; the carving of natural ornament, however conventionalized, architectural mouldings, and the like, should all express the highest gift of Nature—LIFE. We see it in all good architectural work, in the branching vault and the graceful column from which it springs; in the steady, sturdy, but thrusting buttress; in the varied modelling of carved ornament—yes, even in the mouldings of a cornice or of a string course. Whatever in architectural work is endowed with the expression of death is bad art." Good art, on the contrary, is ever imbued with the expression of life, and it is, he adds, refinement of design that mostly helps to give this expression. Nor is it contrary to principle that much of the best architectural ornament is conventional, for conventional ornament should ever be imbued with the spirit of Nature—with its energy, its repose, its beauty of detail and its breadth of effect.

Concentration of Ornament, especially for our larger buildings, is his next point, and one which he asserts is too much neglected in modern architectural works. "The eye wearies of and the mind fails to be interested with a monotony of richness. It is an unwritten law that buildings should be designed in good proportions, that is, with the proportion that has an expression. Another unwritten law or principle with which he deals is that of the true use of detail. Mr. Bodley holds it to be a great but manifest error to suppose that by boldness of detail a building is made to look large. The reverse is invariably he case. Not that it is only detail carefully used which gives scale to a building. The multiplication of parts is an arrangement of much use for this purpose. We know, he says, how skillfully this was done in Mediæval and Renaissance buildings, and the study of the best designed ancient works will make the intention very apparent. Compare, for example, Milan Cathedral with Westminster Abbey, or York Minster, or with other great Gothic churches.

Symmetry, "for the most part applicable to and of chief use for large buildings and those of monumental character," is next touched upon, and then Economy of Material, which is, again, another law of refinement. "Engineers make their calculations of less and more and tell us this or that 'will stand.' But good architecture is not only 'built to stand'; it is built to last from generation to generation. It is no waste to build in such a manner that the eye and the mind are satisfied. Centuries hence men may behold the buildings as we see them now, if not cruelly dealt with by the more ruthless hand of man—the gentle, slow, natural decay of time will leave the inheritance well-nigh untouched. Such strength, combined with a nice economy, should be the aim in designing buildings."

Contrast—"In all the best architecture you will find a noble simplicity of design, due breadth of surface, contrasted with delicate detail"—is followed by Avoidance of Extravagance of Manner. "One has seen too much of this of late in Gothic work. A shaft, only two or three times its diameter in height, is surmounted by a capital out of all proportion to that shaft. This ugly affectation is an exaggeration that becomes a caricature. There is one kind of strongly marked proportion, however, that we need hardly fear to carry out in these days. I mean that of considerable height. The controlling exigencies of economy too often prevent our churches, for example, from rising into stately and inspiring proportions." As to Suitability, "we need not go abroad to find a style in which to design buildings in England. Let us keep the genius loci. Both in Gothic and in Renaissance buildings among us there has been too much copying of a foreign manner, unwisely imported from the Continent. Our own English architecture is second to none for beauty and poetry of design. If on the Continent the architecture is more grandiose, yet it often lacks the refinement and the poetry of sentiment of our English work." Touching on Harmony, he tells us that no eclectic school which mingles styles incongruously will ever be long-lived or successful. The result, if not one of continuous discord, affords but occasional harmony.

Colour is another and an important part of architectural work, whether in the use of marble or other constructional colour, or in painting, and Mr. Bodley also speaks of Consonance with Nature. "Architecture, like music, is not an imitative one, yet its characteristics should be those of Nature, in the spirit though not in the letter. It is the strength and the delicacy, the refinement and the richness, and the other great attributes of Nature, which we should endeavor to embody in our works, rather than any exact imitation."

Finally we come to Truth, the one great unwritten law of architecture and all art. "I need not dwell on this part of our subject; nevertheless, what are many of

our new street fronts in the city and other buildings elsewhere rising around us but examples of most untruthful architecture? Iron columns and iron girders are concealed by stone columns and thin stone friezes and the like deceptions. It is an unpleasant and, indeed, a wretched style of building, without truth or dignity. Should a fire try the nature of the work; the writhing columns and the bending girders will soon show that they are found wanting in that first necessity of good building—stability—and the disguise will be manifest. To conclude, let me say that architecture and all art should be animated by some great and leading principle. Religion is the highest. The noblest buildings in the world have ever been those consecrated to her service. We see this alike in the Pagan temple and in the great churches of Christendom." How far any revival of a great school of architecture is, he adds, possible is a question. The want of unity of feeling, as compared with other times, is one serious impediment to the formation of any school of Art. Is any such unity possible? Is any such school of architecture possible without unity? No doubt the work of architects in these days is, he admits, one of difficulty. It is an age of science, not of art; architectural tradition has been cut off, or rather, alas, we inherit a century or more of bad tradition.

There are, Mr. Bodley says, some signs of the dawn of better things amidst the general gloom, and we may hope, he remarks, that a more intelligent interest may yet be taken in architecture. "Time was when she was the Queen and mistress of all the arts. Is it not for our unfaithfulness that she has abdicated her throne?"

FRESCO PAINTING IN ITALY.

Dr. G. C. Williamson recently gave an interesting lecture on "The Art of Fresco Painting in Italy," in the fine old hall of the Painters' Company in London. The lecture was given for the benefit of the incorporated Institute of British Decorators, and there was a good audience, who followed with close attention Dr. Williamson's sketch of the development of fresco painting, and greatly enjoyed the beautiful series of pictures which were thrown upon the screen to illustrate the sketch.

The lecture began by describing the difference between true fresco, which meant painting on the wet clay as it was laid down, and fresco secco, i.e. painting in tempera on a dry surface, the medium used for tempera being some gelatinous substance such as white of egg or size. In England, he said, there were no examples of the fresco, though there were walls still to be seen which had been decorated in a mixture of the two styles—the background painted wet, the detail added when the clay had dried. This was the method that was also followed largely in Italy, though there, of course, were to be found plenty of examples of fresco buono, the real thing.

Dr. Williamson's examples began with Cimabue, whose famous Florentine Madonna was shown. Giotto came next; several of the scenes painted in the Lower Church at Assisi, one from the arena Chapel at Padua, and others at Florence were offered as characteristic specimens of different periods of his career. A number of lovely paintings with which Fra Angelico adorned what is now the Museo di San Marco, represented his wonderful art very satisfactorily, and Fillippino Lippi was also well represented on the screen. He it was, the lecturer said, who began to make his paintings rather pictures than scenes. Benozzo Gozzoli carried this a step further. He, too, began the practice of introducing into sacred subject-pictures portraits of his contemporaries, a practice that Ghirlandaio carried further still.

With the full tide of the Renaissance came the change from the simple piety of the earlier painters to the enjoyment of beautiful things for their own sake, and soon enough painters were painting pictures to glorify individuals instead of to glorify God. The classic or humanist influence had a great effect upon Mantegna's work, and in it was seen also the desire for movement, which Luca Signorelli carried so far. In the work of Perugino and the Umbrian school was felt for the first time the sense of great space in painting; and when the time of Pinturiccio was reached art had become more and more pictorial and illuminated, and less and less episodic and devotional.

After this Dr. Williamson passed on to the great names of Leonardo, Raphael, Michael Angelo, and the Venetians, and so brought his lecture to a close.

NOTES.

Messrs. Band, Rolph & Meredith, architects, have opened an office at Sydney, C.B.

Mr. Hall Caine, the well-known novelist, author of "The Christian," "The Manxman," etc., like many other well-known men, began life as an architect.

Architects who may desire to exhibit drawings, models or photographs at the St. Louis Exposition of 1903 are invited to submit to the Directors separate lists for each class of exhibits before July 1st, 1902.

Messrs. McKim, Mead & White, Messrs. Carrere & Hastings and Messrs. Babb, Cook & Willard have been retained by the trustees of the New York Public Library to design and supervise the construction of the forty-two branch Carnegie libraries in that city, with the exception of one which it is expected will be constructed from designs furnished by Mr. James Brown Lord. The three firms above named, says the Engineering Record, are to act in collaboration and decide jointly all matters of common import regarding the designs and construction and other details relating to the various buildings. The designing of each separate building, however, and the supervision of its construction are to be entrusted by allotment to the several firms.

In the enrichment of the earlier Roman work, Greek taste prevailed until about the time of Alexander. From this period elaboration and abundance of ornament supplanted the more refined style of art. Carving of surface, as in friezes and mouldings, became universal. Foliage was made intricate in outline, and its surface-carving was so exaggerated that, although extreme fullness and richness were thereby gained, it was invariably at the sacrifice of simplicity and beauty of form. Scrolls grew out of each other, as in the Greek, but the foliated sheaths became long and formed into a number of divisions and subdivisions, often ending in an elaborate centre-flower. The sharp and crisp forms of the Greek foliage became lost in the imitation of obtusely-pointed or round-lobed leaves.

Professor Warren, an eminent Bostonian, speaking of latter-day architecture in New York, says: "In New York the influence of the Ecole des Beaux-Arts is paramount in much of the work, often even to the sacrifice, if not of local, of national character, so that many buildings look as if they had strayed from the Boulevards of Paris. Though we may regret this wholesale importation, this direct imitation, with all its mannerisms, of a style which is full of bad taste and solecism, in spite of the strength in plan and mass of its originators, it does not seem to express New York, and it certainly has been acclaimed there, and is affecting nearly all the work, while it has received but little welcome in other parts of the country, so that this direct Parisian influence has come to be peculiarly characteristic of New York, and may possibly be the starting point of a local manner of building. Lavish display, richness of effect, characterize most of the work, and express the luxury loving New Yorker."

PROCESS OF MANUFACTURE OF STAINED GLASS WINDOWS.

A stained glass window is more properly described says a writer in The Architects' Magazine, as one of coloured glass, for it is on such a glass that the artist paints—in monochrome it is true—his design, and the staining of the glass, if resorted to at all, plays but a very insignificant part in the decorative scheme. Perhaps one may be excused for describing the leading as the most important part of a stained glass window, for the very good reason that without the leading it would be necessary to paint a window in one piece. It is the lead which renders it possible to make up a composition of any number of pieces of coloured glass, and thus gives the artist an almost unlimited range.

In tracing a stained glass window from its inception it should be stated that the artist first makes a small colour sketch to scale, and from this he produces a cartoon in black and white of the exact size of the window space to be filled. The cartoon is now given to the workman, who produces what is called a "cut line" on tracing cloth; that is, he makes a tracing of the principal lines of the artist's picture, showing how the glass is to be cut to meet the needs of the colour scheme. Next is the turn of the master glass-cutter, who, in association with the artist, chooses the glass to be used in reproducing his picture, and when the choice has been made the glazier's skill is brought to bear in cutting the glass according to the indications given by the tracing. The glazier having completed his work, the pieces are put together in form on a sheet of plate glass placed over the cut line or tracing. Any portion of the coloured glass which has showing through it a principal part of the design, such as a head, a hand, or a piece of drapery, has traced on it so much of the artist's work in the pigment—brown being the colour, made up of black, red and umber. The pieces of glass are so placed as to show between them the black lines of the tracing—the outlines of the figures, &c., and every part where different colours are to be arranged in juxtaposition—and it is where the black lines are revealed that the lead subsequently assumes its appointed position.

Thus disposed in perfect scheme so far as colour is concerned, the "stained glass" is waxed into position on the slab of plate glass and then lifted on to an easel, where the task of painting is completed with all the care the artist can bestow on his work. It should be borne in mind that the painting is carried out solely in the monochrome already mentioned, and that it is the coloured glass showing through the brown pigment which produces such wonderful and, of course, almost imperishable effects. It has been mentioned that coloured and not stained glass is the correct term to apply to the principal medium of "stained glass" windows, and here it may be said that practically the only staining resorted to is in the production of gold colour. This is rendered possible by silver staining on white glass, a pretty effect very common nowadays in house decoration. It is really opalescent, but against the light a fine golden colour is shown. When the artist has finished his painting on the easel the pieces of glass are again separated and are fired in a kiln, being placed therein on iron trays. Heat having done its part in burning the pigment picture on to the glass the whole thing is waxed up again and retouching is resorted to, if necessary, with, of course, in that event, refining. Finally comes the glazing with what are termed culms of lead—long strips, grooved on both sides, to carry the glass. All the joins are soldered, and when the window is placed in position, iron bars from three-quarters to an inch in thickness are forced on to the mullion to support the picture, wire being soldered on to the lead, which holds all the portions of the colour scheme in position, and bound round the transversing iron.

CORRESPONDENCE.

CANADA FIRST (?)

To the Editor of the CANADIAN ARCHITECT AND BUILDER.

SIR,—During the last year or two a number of new bank buildings have been erected in Toronto at considerable cost. In these buildings the most expensive kind of materials have been employed, including a large quantity of wrought iron grilles, etc. Probably not less than $25,000 worth of this last mentioned material has been purchased, and so far as I know scarcely any of it was made in Canada, the material having all been imported from the United States. As one of the manufacturers in this line, I have never been asked to submit a tender for this material, although I have successfully filled orders for prominent Canadian architects in Montreal and other cities outside of Toronto. It would be a satisfaction to learn on what ground so much money has been paid to foreign manufacturers by Canadian architects. Is it because satisfactory material cannot be obtained from Canadian manufacturers, or is the price of the imported material less than that of the Canadian made article? As a Canadian manufacturer I do not expect to be given any preference, but think I am entitled to be asked to tender for this kind of material on equal terms with the foreign manufacturer. Canadian architects rightly object to commissions for important Canadian buildings being given to foreign architects. To be consistent they should, as far as possible, employ Canadian materials, and thus assist in the development of home industries.

Yours truly,

MANUFACTURER.

PUBLICATIONS.

LINEAR DRAWING AND LETTERING (for Beginners.)—By J. C. L. Fish, Asso. M. Am. Soc. C. E., Associate Professor of Civil Engineering in the Leland Stanford Junior University. Published by the author. Palo Alto, California. 7 x 10½, oblong. v + 65 pp. 46 figures. Limp cloth, $1.00 post-paid.

The opening chapter of the book gives instruction regarding the proper care and use of instruments. This is followed by courses in linear drawing and lettering and an introductory chapter on drafting.

"Blank Book for Lettering," by the same author, is designed to be used with "Linear Drawing and Lettering." Price, 25c.

Messrs. Houghton, Miffiin & Co., of Boston and New York, have just published a new book on "Applied Perspective for Architects and Painters," by Wm. P. P. Longfellow. Following an interesting introduction on perspective in Nature, are a series of problems to show the application in art and architecture of what may be seen in Nature. These problems deal with a variety of matters essential to the training of artists and draughtsmen. The book comprises 120 4to pages, with 108 illustrations. The price is $3.00 net.

PERSONAL.

Mr. W. E. Doran, architect, of Montreal, is again mentioned as a probable candidate for the mayor's chair in that city.

Mr. Lewis Maxwell, a pupil in the office of Gouinlock & Baker, architects, Toronto, who has recently been indisposed through lung trouble, is now sojourning at the Gravenhurst Sanitarium. His many friends will be pleased to learn that he is getting along satisfactorily.

The six most lofty structures in Europe are the towers of Cologne Cathedral, now 516 feet, 9 inches high; the towers of Rouen Cathedral, 491 feet, 8 inches; the tower of St. Nicholas, at Hamburg, 473 feet, 1 inch; tower of Anvers Cathedral, 472 feet; cupola of St. Peter's, Rome, 469 feet, 2 inches, and the cathedral spire at Strasburg, 465 feet, 7 inches.

—THE—

CANADIAN ARCHITECT AND BUILDER

A Monthly Journal of Modern Constructive Methods,

(With a Weekly Intermediate Edition—The CANADIAN CONTRACT RECORD).

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John Goettsche, of British Columbia, is investigating the clay deposits in South Dakota with the view of erecting an extensive brick works in that state. Tests are being made of the clays in the vicinity of Brookings, and if the results are satisfactory a plant may be erected at that place.

A Small Sewage Disposal Plant of considerable interest is described in a recent issue of "Indian Engineering." It was designed by Mr. C. C. James for a leper asylum with 400 inmates near Bombay, where the sewage originally drained into two large cesspools. These became a nuisance, so a disposal farm was laid out with settling tanks for liming the raw sewage, but the lime injured some of the crops and it had to be abandoned. Finally the land became "sick," and the septic system was introduced preliminary to the land treatment. This has been successful, and the sale of the farm crops yielded last year a profit of 21 per cent. above working expenses. The septic tanks have a capacity of about 19,000 imperial gallons, and the sewage passes through them at a rate of about 20 feet an hour. The leathery scum on the surface is 1 to 3 inches thick and there is some sludge at the bottom. The septic effluent has been used in experiments with a number of filters. One which gave a good result was made with pieces of coal. Another filter which received raw sewage, was made of pieces of brick with pipes to distribute air through it in accordance with the principles advocated by Colonel Ducat. The sewage was 45 minutes in passing this filter and was well purified by the process.

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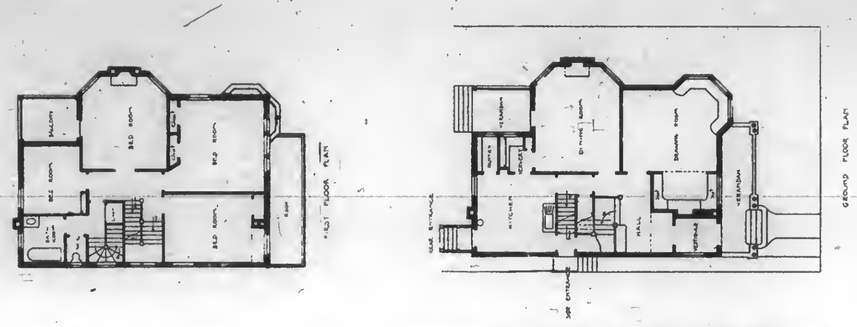

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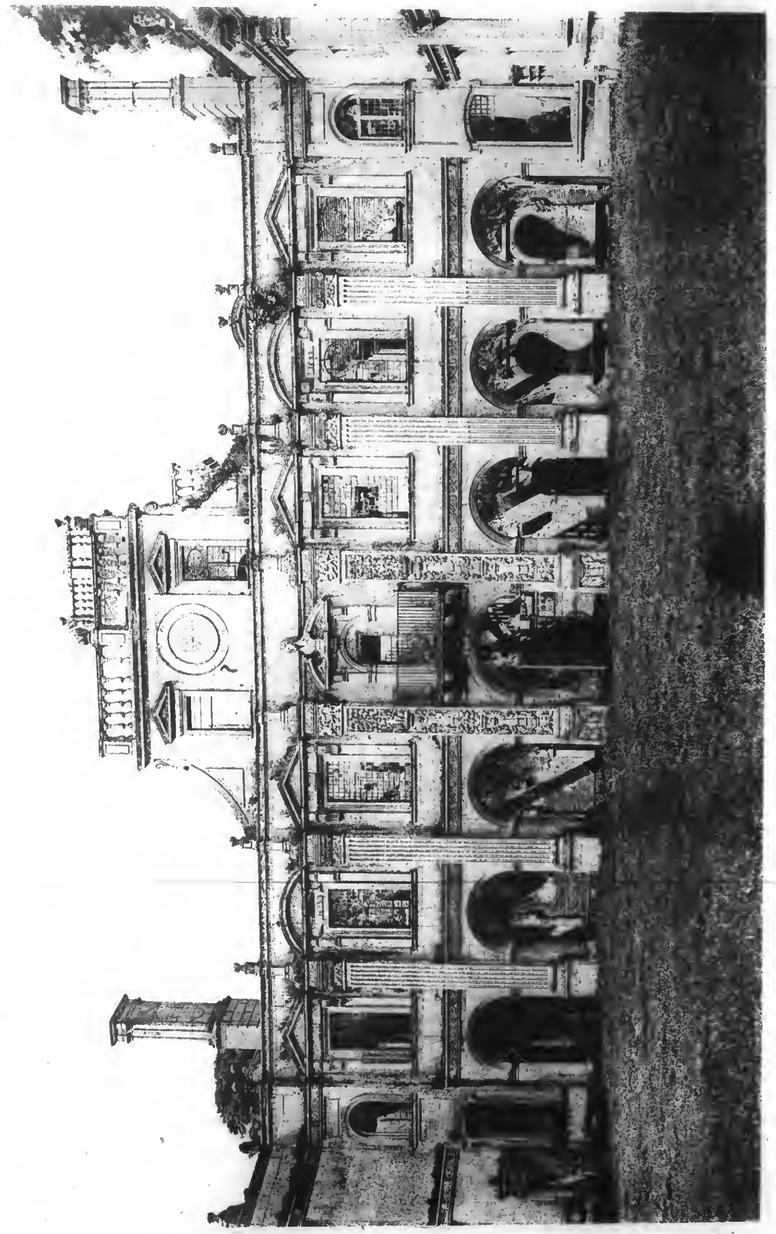

KIRBY HALL.—NORTH SIDE OF COURTYARD.

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CANADIAN ARCHITECT AND BUILDER
NOVEMBER, 1901

The Canadian Architect and Builder

VOL. XIV.—No. 168. DECEMBER, 1901.

ILLUSTRATIONS ON SHEETS.

Pair of cottages in East Toronto—R. J. Edwards, architect.
House Walmer Road, Toronto—S. H. Townsend, A.R.C.A., architect.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Two Photogravure Plates, Exterior and Interior Views of Bank of Commerce, Bathurst and Queen streets, Toronto—Darling & Pearson, architects.
Fire place—Symons & Rae, architects.
Montacute House, England—Sketched by S. A. Heward.

CONTENTS

Editorial	193-194	Safety of Theatres	200
Tests of Portland Cement	195	Mr. Ruskin and Architecture	200
The Amended Building By-law of Toronto	195-196	Notes	200
Export Conditions Affecting Heating Apparatus	196	Northwest Correspondence	201
By the Way	197	Students' Department	202
Organ Chambers and Cases	197	American and Continental Heating Practices and Appliances	203
Color in Architecture	198	Decay in Timber	ix.
O. A. A. Convention	199	Window Glass Monopoly	x.
Architectural Education	199	Stone Working in Athens'	x.
Early English Cathedral	199	Montreal Builders' Exchange	xiv.
P. Q. A. A.	199	A Stone Barometer	xiv.

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N.S.W. Industrial Arbitration Act

To the government of New South Wales belongs the credit of having departed from the beaten path in respect to legislation for the settlement of industrial disputes. The Industrial Arbitration Bill which has just become law, compels reference of all disputes between employers and employees to a competent court, with power to enforce its orders and awards, and makes a strike or a lock-out before or pending such reference a misdemeanor, punishable by fine or imprisonment. The court will be presided over by a Judge of the Supreme Court and will have most extensive powers, including the power to declare a standard wage, and to direct that, other things being equal, an employer shall give preference to unionist over non-unionist laborers. There is no appeal from its decisions. The result of the operation of this law will be watched with great interest, particularly by the great industrial nations.

Effect of Stock Speculation on Building.

THE American Architect states its belief that much of the indisposition manifested by small capitalists to invest in land and houses is due to speculation in stocks and the losses resulting therefrom. "Every one who takes note of the course of stocks," says our contemporary, "will remember shares which a few years ago were sold with the recommendation of bankers of the highest standing at fifty dollars, and after paying an assessment, could with difficulty now be disposed of at fifty cents, or a copper stock which has fallen within a few months from seventy-five to five dollars a share." There undoubtedly exists good foundation for the above opinion. Unfortunately Canada is following the lead of the United States in this matter. Our young men, especially business men of all ages and in every line—not excluding the professional man or even the preacher—are seeking wealth by a short and easy road. A few are succeeding, but the majority fail, and the community is poorer by the money lost in this way which should have gone into building improvements and other enterprises of a tangible character.

Importance of Proper Inspection of Building Work.

THE necessity for careful inspection of construction work on important buildings is exemplified in the case of an expensive city church, in the roof of which a number of leaks have developed. On investigation, it was found that the valleys extended only four inches instead of four feet under the slates, allowing water and ice to find access beneath the edges of the slates and destroy them. Two or three hundred dollars have already been spent on repairs and it is estimated that six hundred dollars more will be required to make the roof weather-proof. Another instance is that in which the authorities of a church are confronted with the necessity of lowering the furnaces in the basement in order

to make them comply with the insurance regulations, which provide that the tops of turnaces must be so many inches clear of the joists. The authorities must either lower the furnaces and piping at considerable expense, or run the risk of getting no insurance if fire should destroy the church. These buildings were constructed under the supervision of an experienced architect, who was probably too busy to watch the progress of the work in detail. Where such important interests are involved, however, the client has a right to demand that there should be careful inspection of the work if not by the architect, by his deputy or a clerk of the works.

Value of the Drop Test

THE increased use of iron in construction has drawn attention to the necessity of using other methods in addition to the tension test for determining the soundness and strength of materials. The value of the drop test in this connection is becoming more generally recognized. The usefulness of this test and the best method of conducting it are treated of in a recent paper by M. Ch. Fremont, in the Bulletin de la Societe d'Encouragement pour l'Industrie Nationale. The writer shows that the results are very different if a test bar is broken by a number of moderate blows applied consecutively or by a single heavy blow. He therefore insists that a drop test should be made by a single blow producing rupture of the test piece, in contradistinction to the method which has prevailed of preparing a number of similar test pieces from the same metal and subjecting these to a series of drops of gradually increasing height, with but one drop to each piece, until one piece is broken. M. Fremont has devised a system for measuring the residual living force in the ram after the drop has injured the test piece, the difference then giving the resistance of the material. As the result of experiments on more than ten thousand specimens he has decided to use a standard test piece 10 millimetres wide, 8 millimetres thick and 30 millimetres long. These dimensions permit specimens to be readily cut from boiler and ship-building plates as well as of heavier parts. In view of the importance of the drop test as an auxiliary to the tension test, it is desirable that in future specifications should demand the application of such a test in addition to the tensile test.

The Toronto Technical School.

The Toronto Technical School has become an expensive institution. A building was recently provided for it at a cost of nearly $100,000, and the running expenses have become a heavy item. The general taxpayers who have to provide the necessary funds, should be interested in seeing that the school is properly managed. The impression prevails that considerable bungling has taken place owing in part to the preponderating influence of members of the Trades aud Labour Council on the Board of Management. A radical change was recently made in the method of management, the services of a principal being dispensed with and the general management being vested in a committee. Each department of the school was placed in charge of an instructor, who in turn was made responsible to the committee. Judging by the determination of the committee to appoint a new principal, this plan seems to have failed. Prof. McKay, of McMaster University, was chosen for the position, but after having accepted, reconsidered the matter and decided to remain in his present position. The selection of a qualified person to become the director of the school is attended with difficulties and fraught with important consequences. Having assumed heavy financial responsibilities in providing a building, equipment and teaching staff, a successful result must largely depend on the selection of a thoroughly qualified manager. In addition to being familiar with all that has been done and is being done in the line of technical education on this continent and in Europe, he should have knowledge of the special requirements of a Canadian school, and what is still more important should have power to organize and maintain in highest efficiency the various departments of the school. It was doubtless unavoidable that mistakes should have been made in the initial history of an institution designed to impart instruction on new lines, and for the organization of which there were few precedents. This experimental period should now be nearing its close, however, and from this time forward it should be possible to proceed on more clearly defined and certain lines, and to achieve results which should justify the large expenditure involved.

TESTS OF PORTLAND CEMENT.

The purposes for which Portland Cement is employed are increasing so rapidly and the manufacturing capacity is developing at such an astonishing rate that there is greater need than formerly for methods by which the quality of the material may be speedily and accurately determined. Much attention was given to this subject by the International Association for testing materials, at its third Congress, held in Budapest last September. Among various papers on cement and cement testing, presented by members of the Association, was one on "The Constancy of Volume of Cements," by Mr. Bertram Blount, cement chemist, of London, Eng. The author suggested the adoption in quantitative form of a hot test for Portland Cement which in its qualitative form has long been in use in the construction of harbors and other public works, viz. :—A bar of neat cement is exposed to the influence of water at 45° C, and the expansion observed by means of the Bauschinger apparatus. A good cement should remain absolutely free from cracks, and should expand not more than 2 per cent. attaining constancy of volume in seven days. The application of this test to sixty-eight specimens of cement produced by five leading English manufacturers, gave satisfactory results in twenty-nine cases.

The president of the Association, Prof. Tetmajer, of Zurich, a high authority on the subject, stated that out of 127 specimens to which this test had been applied in his laboratory, only three had failed, and that the hot test for cement had already been adopted by the Swiss Federal government.

It is probable that a form of hot test will be included in the specifications for Portland Cement to be discussed at the next Congress which will take place in St. Petersburg in September, 1903.

After a lengthy discussion the Congress adopted a motion by Prof. Wm. Hawe of New York, for the appointment of an International Commission to collect so far as possible before the next Congress, material for establishing normal tests and specifications for Portland Cement, which may be used in international commerce.

THE AMENDED BUILDING BY-LAW OF TORONTO.

The Toronto Building By-law which has for so long a time been in retirement and understood to be in a constant state of revision has at length emerged from this lonely furrow and put itself at the service of the citizens of Toronto.

It is a remarkable by-law in respect that what there is not in it would make a fair-sized volume—and a very useful volume too. The law as it is given to us, deals chiefly with negations and even then it likes to be general. There is no doubt safety in generalities, to guard a position of power. For example, the opening clause of the by-law, the clause relating to the Inspector of Buildings, is admirable. It states simply that the duty of the Inspector of Buildings shall be "to see that the provisions of this By-law are carried out." This is simple, but comprehensive. It guards the power of the Inspector more effectually than the most elaborate definition of his rights. But, when we come to examine the provisions of the by-law, we find they are of the same nature—guarded rather than explicit. It is as if the authors of the by-law took the view that the municipal council is the natural enemy of building in Toronto, prepared only to swoop down upon it for offenses, instead of the view that the council are the city fathers, to lead intending builders in the way they should go to make the building of the city good.

One evil of a by-law full of generalities is the likelihood of conflict between builders and the Inspector, on the ground that where there are no definite directions the builder's opinion is as good as the Inspector's, and perhaps it may be. For example, under the head of Public Buildings, Sec. 31, it is provided that "no church, hospital, college, school, hall, theatre, or other building of a like nature used as a place of worship, or for public meetings of amusement or resort, shall be used or hereafter constructed unless the same contains such a number of doors, halls, stairs, stair railings or other means of egress "it is to be hoped this will not give colour to the idea that sliding down a handrail is permitted." of sufficient size and strength as in the opinion of the Inspector of Buildings shall afford ample facilities for free and rapid egress in case of fire, panic, or other cause." This is all very well, but public buildings are not erected by the "cut and try" method. An Inspector cannot come on the works of a public building in June and tell the architect that a passage-way he planned in January, must be a couple of feet wider. The plan is figured throughout to meet the existing dimensions, and the iron is all on the ground. The Inspector will either have no opinion upon that point, or if he has, and wishes to make it law, he must expect to find ample facilities afforded for his free and rapid egress from the building. This will not make for the authority of the law. It would be better if it was settled beforehand what is to be the standard in all cases where there can be the question of a standard. Then it will be known in advance what the opinion of the Inspector is going to be; and any dissent from it can be settled in advance, before the plans are made.

This would imply more work than the construction of the present by-law, but genius is not required; the process is one of compilation. If there ever was such a thing as a first by-law, no living human being has seen one. All bylawsare scompiled, and the process is commended to the city officials as a fascinating labor, in which perfection is attainable, and whereby they would learn a lot. Indeed it would not have been necessary to do so much work as might at first sight appear in order to fill in the deficiencies of this by-law, for the ground was well covered in a draft of by-laws, drawn up in 1895, with great care and many meetings, by a select committee of the Ontario Association of Architects, and placed in the hands of the City Engineer; among whose records it may doubtless still be found. That this draft was rejected by the revisers of the by-law argues that they aimed at something different, but it is difficult to see what they aimed at; it is difficult to grasp their purpose. If it is only a fire by-law, why enter into the question of the thickness of brick walls? If it is a building by-law, why not tell us some more? The thickness of a wall in proportion to its height is not the last word about building a wall. One of the notable building failures of New York was due to the quality of mortar used. There is not one word about mortar in this by-law. Nor is there anything said about the length a wall may run between cross walls or buttresses, for a given height; yet, even if this is merely a fire by-law, it is a consideration important for the safety of firemen that there should be some limit fixed in this.

The by-law should, in fact, declare the standard of sound building in all points. This sounds like a large order, but that it is possible is easily seen from the simple fact that it is done. The building by-laws of the great cities of the United States are compendiums of the art of building as locally practised. Indeed it is not necessary to go to the United States for example. The Montreal Building By-law is before us. It contains the usual precautions against fire, more complete than those of Toronto, where we have compared them. It contains also the rules for thicknessing walls, better stated than in the Toronto by-law because displayed in the form of tables, where the average sensual man can grasp them better than if, as in the Toronto by-law, he has to dig painfully for them in a six inch legal paragraph with one full stop. But it contains much more than this. There are full directions for building according to a standard of safety; and that is what we want in Toronto. The Montreal law takes hold of things from the very bottom by specifying the depth of the frost line; and from there up the builder has given him an authoritative decision upon every point, as to what constitutes good building. Footings, foundation walls, damp coursing, stone walls, brick walls, hearths and chimneys are all treated; and the different compositions of mortar are introduced in an intelligent manner as a condition affecting the loads permissible on walls. The strength of floors for buildings of every class, the strength of roofs of all pitch, are fully defined. To be

brief—for we write, not to praise the law of Montreal but to condemn that of Toronto—all questions of standard that arise in designing a building have in the building law of Montreal and other cities a minimum fixed by-law. The result is a sound handbook of building for these cities, and that is what we want in Toronto. For many men it will be the only handbook they recognize, and without it they have none.

As a record of the decisions approved by the general experience in building matters, such a by-law is uselul to architects as well as builders, not only to save labour but to save doubt and discussion ; to, in some measure, standardize processes which form so large a part of the investment of capital. The building laws of New York and Boston have before now been used in Toronto, as authorities for this purpose ; but a by-law of our own would be the proper authority.

In short the law is for instruction as well as reproof. If the whole object of the building law were to catch people tripping, it would be well to be as cautious and general as possible, and to give as little information as possible in order to catch the ignorant and unwary as well as the wicked ; but the object of the law ought to be to prevent people tripping ; to instruct the ignorant, warn the unwary, and leave the Inspector of Buildings to deal only with the wicked. That is his function and that is all.

To leave anything that can be settled beforehand, to be settled by the opinion of the Inspector of Buildings is nonsense. He is there to administer the law not to make it. The municipal council have power to make reasonable by-laws, but they have no right to delegate this power to anyone else. In making a by-law so general that it requires interpretation in detail, and in handing over the right of interpretation to the Inspector of Buildings they have in effect delegated to him the power of defining the requirements of the law. It is questionable whether this is a legal position ; it is certainly unpractical. The city of Toronto is still without a reasonable building by-law and something ought to be done to remedy this defect.

We want a precise and comprehensive by-law, printed in a convenient form, with tables, diagrams and cuts sufficient to make it plain, and an index. This is not much to ask for, but it would be a great thing to have.

EXPORT CONDITIONS AFFECTING HEATING APPARATUS.

A gentleman from Canada, intimately connected with the building business, visited the Glasgow Exhibition last summer, and on his return expressed disappointment with the character of many of the Canadian exhibits in manufactured goods. He instanced the case of radiators, in the manufacture of which Canada must be considered to be at the top of the ladder. The exhibit of these goods in the Canadian Building consisted of only a few radiators placed in an out of the way corner. The same gentleman made unfavorable comparison between our exhibits of stoves and those of British manufacturers, stoves being another line of manufacture which has reached great perfection in this country. He further stated that the American radiator manufacturers had captured the British market, and, to a large extent, driven out Canadian radiators.

In response to enquiries on the subject, we find that the small exhibit of radiators in the Canadian Section was placed there by request of the Canadian Commissioner, and that accommodation could not be given Canadian manufacturers in this building to make an adequate display of their goods. Another exhibit in this line was made in the British Section in the name of Messrs. T. B. Campbell & Sons, of Glasgow, who are agents for the Dominion Radiator Company. It is to be regretted that in lines of manufacture in which we admittedly excel, we should not have had proper representation. A manufacturer who visited the Exhibition informs us that the nations that had the fewest exhibits, such as Russia and India, appeared to have the most space, far more in fact than they required, while Canada, which is an important part of the British Empire, was not given room enough to fairly display her goods. Attention was recently called to the fact that a creditable display was not made in the Canadian Building at Buffalo, that Canadian exhibits were scattered about in the various buildings in such a way as to make it impossible for the visitor to receive a comprehensive idea of our development in various lines. The same objection seems to hold good in the case of the Exhibition at Glasgow. It is to be hoped that if Canada is to be represented at future Exhibitions of this kind, the Government will see to it that adequate space for the purpose is obtained, and that the exhibits are displayed to equal advantage with those of other countries.

As regards the competition of American manufacturers of radiators in the British market, we learn that a large share of the trade in this line is being secured by the United States. This is chiefly due to two causes, first, the advantage possessed by American manufucturers over those of Canada in carrying charges. By taking advantage of cheap transportation by canal from Buffalo to New York, and from thence chartering schooners to carry their goods at very low cost across the Atlantic, United States manufacturers are able to sell in the British market at lower figures than Canadians are willing to accept. To assist them in maintaining their advantage, these manufacturers are now bringing iron from the Dominion Iron & Steel Works, at Sydney, Nova Scotia to Boston, at a cost for freight of only 70 cents per ton. On this iron a duty is paid of $4.00 per ton, 99 per cent. of which is however, refunded, on the manufactured product of the iron when exported, so that the Boston manufacturer effects a saving of $3.00 per ton in freight charges by using Canadian instead of American iron.

The manufacture of radiators in the United States is in the hands of an immense trust whose aim is to keep in operation their extensive factories. For this purpose they have apparently determined to secure the trade in Great Britain at all costs. Extensive showrooms and warehouses have been opened in London where a large stock is constantly carried, from which orders can be filled instantly.

Notwithstanding Canadian manufacturers are getting a considerable amount of export business, and are at present favored by the fact that for the first time in many years iron is being sold in Canada at $2 per ton less than in the United States. The demands of the home trade have been so great as to keep factories here running at their highest capacity. Under these circumstances our manufacturers are not disposed to sell their goods in Great Britain without a profit.

BY THE WAY

The law under which gardens and pleasure grounds in France have been exempt from taxation, has been repealed. It is feared that the result must be the filling up of such spaces with buildings greatly to the detriment of beautiful cities like Paris, which has become the admiration of the world largely in consequence of the encouragment given property owners to beautify the surroundings of buildings.

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The heart of the architect and builder, who happens to have any work to do, and the majority have, has been gladdened by the unusually delightful weather that has prevailed throughout the autumn and thus far into the winter. The click of the roofer's hammer and his merry whistle may still be heard in many directions, having outlasted the twitter of the birds whose instinct impelled them to migrate southward. Not only is advantage being taken of the favorable weather to finish up outside work on buildings in the advanced stages of construction, but during the last month work has been commenced on quite a number of new projects, the foundations of which will at least be put in before Jack Frost puts his temporary veto on the proceedings.

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I am pleased to observe that as the result of numerous complaints from citizens the City Council of Toronto have requested the City Engineer to report on the advisability of erecting a stand pipe to draw off the gas from the Yonge Street sewer and prevent its escape at the street gratings. Some of the north-end streets are even worse than Yonge Street, and in the interests of public health, means should be found of preventing or reducing to a minimumthe countflow of gas at the street level. There is little doubt that contact with this foul escaping gas has been the cause of much sickness. The evil, which is aggravated in cold weather by the difference in temperature inside and without the sewers, should be remedied. Half a dozen stand pipes would doubtless effect a cure so far at least as the northern part of the city is concerned, which district on account of its higher elevation, is most affected. Objection has been made to the erection of stand pipe ventilators on the ground of their unsightliness. It should be possible however to place them alongside the poles carrying electric wires or in some equally inconspicuous position. In any case much as we should regard the good appearance of our streets, the protection of the public health is a matter of even greater consequence.

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It is perhaps ten years ago since the city of Ottawa commenced the erection of a hospital for the treatment of contagious diseases on Porters' Island. The structure was so wretchedly built that it had to be abandoned. The Council then began casting about for another site. One after another was chosen only to be abandoned in the face of injunctions secured by owners of adjoining properties. So matters have gone on year after year even until the present time, and the end is not yet. Even the presence of smallpox which is reported to be prevalent in Ottawa at present, does not appear to hasten the progress of the project. The undertaking will probably await the advent of another generation of aldermen, who starting de novo, and undaunted by the recollection of past failures, may succeed in carrying it through.

ORGAN CHAMBERS AND CASES.

Canadian architects will be interested in reading the suggestions for the proper installation of pipe organs in concert halls and churches, as given by Mr. Chas. F. Brindley, member of a well known British firm of organ manufacturers, in a paper read before the Sheffield Society of architects and surveyors.

Dealing first with the placing of organs in concert halls, the best position for the organ was at the end of the orchestra. Special attention should be given to allowing ample space, so that the organ may be built on one level, in order that it may be affected by changes of temperature and so thrown out of tune by the consequent expanding of metal pipes, which occurs when instruments are constructed at different heights. In providing for machinery for blowing care must be taken that (a) the room be dry ; (b) within reasonable distance of the organ proper ; (c) the temperature be the same as that of the hall.

Dealing next with the placing of organs in places of worship, the lecturer stated that lack of space allowed and disregard to all proportion were the greatest evils. The placing of the organ on a screen dividing the nave from the choir was undoubtedly the best, but is unfortunately seldom adopted and favoured by modern architects. Putting an organ in the west gallery is highly recommended by many experts. An organ chamber was not a good place for an organ. If this latter method be a necessity, the lecturer pointed out that it devolved upon the architect to design such chamber so as to mitigate the evil as much as possible by providing plenty of space, making it of sufficient height, and having ample opening into the church for the ingress of sound.

The government of Quebec will invite the artists of the province to submit designs in competition for an historical tableau with which to decorate the assembly room of the Quebec legislature. A prize of $2,000 will be offered.

COLOUR IN ARCHITECTURE.

Mr. A. Wallace Rimington recently presented a suggestive paper before the Architectural Association on "Colour in Architecture as seen through an Artist's Glasses." We lived, he said, at a time when from various causes the colour sense of civilized Europe had seriously deteriorated, and when, although there was some slight revival or new development of the feeling for colour amongst the cultivated few, it was, perhaps, becoming more and more weakened or obliterated amongst the great majority. Taking a general view of Europe, and, excepting this partial revival, it was difficult to avoid the conclusion that in decoration, in costume, and in the thousand small objects of everyday life colour tended to disappear, and, speaking broadly, where it remained, to become more crude and less harmonious.

In Architecture, as the oldest and possibly the greatest of all arts, the study of colour could not, of course, be neglected. Whether we liked it or not, it must come into play more or less in every building. "All materials possess colour of some kind, and this colour directly affects the impression produced by a building. Moreover, the good effect of any architectural work, fine in respect of proportion, line and detail, may be completely destroyed by a vulgar colour scheme, with bad divisions of its colour masses or inartistic colour accentuation of unimportant parts; whereas, on the other hand, harmonious and refined colour may, as we all know, add immensely to its interest and dignity." He admitted that the whole question of colour was surrounded by great and special difficulties. Colour was, however, quite as difficult to deal with as musical sound, and probably much more so. It was not easier to strike an absolutely true colour note than to sing a musical one, and the colour scale had longer and more subtly graduated vibrations. Every good picture was a series of colour chords, carefully selected and combined, and it might be asserted that every building ought also to be, even though its colour harmonies may be simpler.

Dealing with the principle that the richest colours should be in the halt tones, and applying it to architectural design, Mr. Rimington contended in exteriors, in which varied colour enters, it would indicate the undesirability of putting a weaker colour into a cornice immediately under the eaves of a building, into the under-cut portion of a projected moulding, or into any hollowed or shadowed surfaces, rather than into those exposed to the full strength of the light, conversely if it were desired to strengthen the general colour effect it would be well to enrich the former with relatively strong and warm colour. One was often struck, from the painter's standpoint, by the way in which a building of warm-toned material had been made unbearable to the artist by the shivering coldness of its painted woodwork, just where the eye, accustomed to Nature's methods, would expect additional warmth and richness. Examples of the advantage of keeping recessed mouldings warm and full in colour might easily be found in the mixed brick and terra-cotta architecture of Italy, especially of such districts as those of Pavia, Milan, Bologna, and Brescia. In the church of Chiaravalle warmth and richness of colour were throughout introduced into the shadowed mouldings and cool coloured materials were always avoided in them; and the same thing applied to the exquisite little campanile of San Gottardo at Milan.

Referring next to the twin principles of "inter-contrast" and "quality:" the interweaving of divergent colours which tended to make them appear pure and luminous, and "quality," a vague term which might be roughly defined as texture, he said it was obvious that these two sister principles were also very applicable to colour in Architecture. One sometimes saw a building or part of a building which was interesting in its forms and detail, and at the first glance was not absolutely bad in colour, and yet one felt it was monotonous and unsatisfactory, and that it would be impossible to sit down and paint it. One asked oneself "Why?" and one discovered it was because its colour surfaces were dead and uninteresting, and because there was no play of intermingled colour and no "quality" in them. As texture so much affected colour, the architect could by using varied and contrasting surfaces make the colour of his stone, brick, metal or other material more pleasing to the eye. If this applied to exteriors, how much more to inferiors. There the architect had endless opportunities for producing colour which should be real colour and of educating the colour sense of his clients. Paint, distemper, and other stains, gilding, coloured materials of all kinds, gave him a palette almost as rich and varied as that of the artist.

Gradation, "focusing" and contrast were dealt with in turn. He had seen many charming examples of the latter in architecture in Italy and Spain and in other parts of Europe. The harmonising effect of the detached and isolated points of strong colour in many Moorish and Arabic buildings was often delightful. Skilful contrast of colour would seem to be of special use in architecture where the building itself was relatively uninteresting. Mr. Rimington submitted that as harmony of colour was of the first importance in painting, it was also of the first and greatest importance in colour as applied to architecture, and in much of our modern work was insufficiently studied. Sympathetic study of harmonious colouring would seem to be as needful for architects as it was for painters; and as it was now mainly a matter of artistic feeling—he put in a plea for the study by architects of the great masters of colour in the sister art of painting.

Whatever architecture might have done in past the for the development of the colour sense, it had it in its power to do much more in the future. Architecture was the one art with which all classes were in contact, and which perhaps more than any other had the opportunity for silently presenting and interpreting beautiful form and colour to them. Those amongst painters who loved and reverenced good architecture with an intensity which could not be put into words, and who had drawn so many of the great buildings of the past with a thrill of enthusiasm they could never forget, sometimes had visions of cities in which every building should be full of interest and beauty, and in which colour should play an infinitely greater part in architectural design than it did at present.

Mr. W. F. Harper, architect, of New York, formerly of Barrie, was unexpected called home by the death of his brother the late Mr. H. A. Harper, who was drowned while heroically attempting to save the life of Miss. Fielding at Ottawa.

O.A.A. CONVENTION.

The annual convention of the Ontario Association of Architects will be held on Tuesday and Wednesday, January 14th and 15th, 1902. The Council has made arrangements for an interesting programme of papers and discussions and hopes that every member will attend and that this will be a representative gathering of the architects of Ontario.

Besides important matters of business, papers will be read by Dr. P. H. Bryce, secretary of the Provincial Board of Health, on "The Disposal of House Drainage in Localities not having Sewers;" by Mr. C. H. C. Wright, on "The Behaviour of Steel under Stress;" by Prof. Capper of the Department of Architecture of McGill University, Montreal, on "University Training in Architecture," and by Prof. Warren P. Laird of the Architectural Department of the University of Pennsylvania on a subject not yet announced. The Council will be pleased to have the attendance of all architects of the city and province.

ARCHITECTURAL EDUCATION.

The importance of providing means for the thorough education on proper lines of architectural students is every year becoming more clearly manifest, and is receiving increased attention at the hands of the governing bodies of architectural societies in Europe and America. In his recent address to members of the R.I.B.A., the president, Mr. Wm. Emerson, gave expression to his views on this subject, in terms following:

"One thing on which all who are experienced in the training of the human mind are agreed is that a good general education must precede special knowledge. This is an axiom which guides your committee in their educational work. It finds expression in the large number of subjects we provide, all of which we consider it of importance that every architect should be acquainted with. It is essential that our curriculum should aim to be comprehensive, to lay a good foundation of general architectural education which will fit men to adapt themselves as readily as possible to the special line they may wish, or be compelled to adopt. If your foundation is not sufficiently deep and wide you will sooner or later show signs of settlement. So much for our successful past and hopeful present. I will now with your kind indulgence deal with what I am persuaded we ought at once to take in hand. I refer to the establishment of day courses of instruction, and I will give you reasons which I think will commend themselves to you as indisputable. Not that I claim orginality for this idea. It has, like almost every other subject which affects the profession, been discussed many times by your Committee, but dismissed for the time being mainly on financial grounds. In the first place, our system of pupilage—necessary and excellent as it is in principle—is still admittedly and radically faulty, from the standpoint both of the master and of the apprentice. The former is too busy to undertake the pupil's education; it is as much as he can do to give him the run of his office, to allow him to spoil material and waste his paid assistant's time in gleaning what knowledge he can. The latter finds himself irrevocably bound to serve at least three years, even if he discovers within the first few months that he has mistaken his vocation. A two year's full course of study in a purely architectural college, controlled by experienced architects, would obviate both these objections to the present system without in the least endangering it and I am sure that most architects in practice, and probably every Fellow of the Royal Institute of British Architects would, as an encouragement to a movement which would secure useful servants from the first, not only agree to accept a rather smaller premium, but probably also to a less lengthy apprenticeship. The pupil, on the other hand, would as a rule discover during his first two or three terms in such a school whether he was fitted for the work, and would be free to drop its further pursuit without loss of time or premium. It would be a truly advantageous arrangement to both parties. With the exception of the Victoria University at Liverpool, I believe King's College is the only institution in this country which has an architectural day school, but King's College architectural course appears to be a department of what is really an engineering school.

THE EARLY ENGLISH CATHEDRALS.

Public interest in and appreciation of good architecture must undoubtedly receive a stimulus from lectures such as the one delivered at Victoria College, Toronto, a few evenings ago, by Rev. Prof. Cody, entitled "The Early English Cathedrals." Even a brief contemplation of the many beautiful examples of architecture thrown upon the screen, and of the explanations given regarding the characteristics and development of the various periods and styles, must lead to results in this direction.

Beginning with the Norman period, the lecturer traced the development of ecclesiastical architecture in England through the Early English Decorated and Perpendicular periods. Reference was made to the contrast in purpose and design between English and French cathedrals. The former were primarily built for the clergy, the latter for the people. Hence the English cathedrals are usually surrounded by open spaces, schools and dwellings for the clergy, while as a rule, the French cathedral is situated in the heart of the city closely encompassed by shops and dwellings. In design the English cathedral is low and broad, the French high and flamboyant, like that at Rouen.

The audience were shown by means of excellent lantern slides in the hands of Mr. Robert Parker, exterior and interior views of the great cathedral churches of England, from Canterbury and Winchester to St. Paul's, but strangely enough were given the name of only one architect, Sir Christopher Wren, who is said to have received for his services the munificent sum of £200 per annum, for which as he said he "consented to be hoisted three times a day to the top of the dome, at great hazard to his life."

THE P. Q. A. A.

The Annual meeting of the Province of Quebec Association of Architects will be held in the City of Quebec on Friday, January 24th, 1902. The Counci has been called to meet on January 9th to complete the programme.

Mr. William Emerson, President of the Royal Institute of British Architects, has been elected an honorary member of the American Institute of Architects.

MR. RUSKIN AND ARCHITECTURE.

Sir W. Martin Conway, who has been elected to the Slade Professorship of Fine Arts, at Cambridge University, for the usual term of three years, made some suggestive remarks on the occasion of Prof. Petrie's lecture on Egyptian architecture. He confessed that as he watched the slides upon the screen and listened to what Prof. Petrie said, it occurred to him how very strong an illustration he had shown them of one very interesting fact which he thought might be observed throughout the whole history of architecture, and that was how frequently architecture styles had arisen from the exact contrary to the statement made by Mr. Ruskin. He meart the imitation in one material of forms devised for another. He rather thought it was one of the axioms of Mr. Ruskin that nobody should ever do any such thing as to imitate in one material decorations which were prepared for another. But in the history of architecture he believed it had always been the case. Styles had been developed by doing the very thing deprecated by Mr. Ruskin. In the earliest form of architecture, which they had now had revealed to them, they had the very beginnings of stone architecture—or, at any rate, of the decorative forms used in the earlier stone architecture—derived by direct imitation from the old forms developed when the material of building was not stone. And just that occurred then, so it occurred in Greece when stone architecture arose, by the imitation of the forms devised for wooden architecture. He thought they might take the lesson to themselves in the present day, because they were living in an epoch when exactly the same thing was taking place. They saw the metal construction coming in and about to become the dominant constructive feature in all the architecture of the world. He noticed the other day in New York—and he supposed every one had noticed it—that in the great buildings which were really metal buildings faced with other material, the architectural forms were all imitations of those forms which were devised as decorations or even, as structural features in old stone buildings. So in the present day they saw going on exactly the same architectural process of development which had been illustrated that night in the extraordinarily interesting beginnings of architectural art described by Prof. Petrie.—The Architects' Magazine.

SAFETY OF THEATRES.

In opening a discussion on the subject of the London County Council and Theatres, Mr. Edwin O. Sachs the well known theatre architect of London said the countries of Europe and the Western Hemisphere had every kind of legislation conceivable for the protection of the public. It was really time for some representative body of experts, officials, managers and business men to decide as based upon the experience of the great cities of the world generally, what was really essential, and then to see to what extent the world's wisdom could be applied to the best advantage of Great Britain and the Metropolis in particular.

To my mind, continued Mr. Sachs, the clear planning in a theatre is of greater importance to the audience than clever fire-resisting construction, and the regular attendance of reliable fire-watchers day and night and especially during the performances, is more essential than any amount of surprise inspection; but these are only personal views. I consider the order of precedence for theatre safety to be :—1, straightforward planning; 2, regular watching; 3, skilled inspection; 4, good construction. The protection of life by means of rapid exit, should always have the first place. I have been over many theatres built according to modern regulations, of the best fire resisting materials, and yet have found them dangerous in the extreme, through bad arrangement of staircases and passages. As to our latest London County Council theatre regulations for new buildings, although they contain much that is extreme on the one hand, and neglect some points of vital importance on the other, they are in many respects model ones, and speaking generally, both the playgoer and the aspiring theatre builder can be well satisfied with them.

In conclusion, Mr. Sachs proposed that the Lord Chamberlain should appoint a special commission, which should draft some practical scheme by which the essentials of theatre safety might be obtained, and some practical scheme for control and administration be formulated.

NOTES.

The Annual Architectural Exhibition of the Philadelphia T Square Club will be held from the 4th to the 18th of January.

The first of a series of lectures on art under the auspices of the Ontario Society of Artists was given recently by Mr. B. E. Walker, his subject being "The Early Italian Painters."

The owner of a recently completed apartment house building in Chicago states that by the expenditure of $8,000 in fireproofing materials, he secured a higher class of tenants at an averaged increased rental of $5 per month for each apartment above the highest rental anticipated before the change in the specifications was made. This increased rental amounted to $1,680 per annum, or 19¼ per cent. on the amount expended for fireproofing.

The interesting experiments originated by Prof. Hele-Shaw for studying the motions of a fluid are being followed by somewhat similar investigations into the movements of air. The apparatus and the method are the invention of M. Marey, a member of the French Institute, and seem to have been inspired by Prof. Hele-Shaw's system. M. Marey makes the movements of air, contained in a suitable glass-sided box, visible by injecting numerous jets of smoke which form planes laminating the air. The results are photographed by the aid of a magnesium flash light.

The excavations were commenced lately for the foundations of the memorial to Charles Garnier at the Rotunda of his principal work, the Paris Opera House, but a further delay in the progress of the work is inevitable. It appears that the site selected was used for one of the builder's workshops, and for a depth of about 7 feet debris and fragments of stone were met with. With such a foundation it would not be possible to support a heavy memorial of bronze and granite. It will therefore be necessary to carry up the foundations for about 20 feet, and as they will be in solid masonry and the space is limited, the time occupied may extend to months unless extraordinary expedition is used. It is therefore possible that the memorial will not be inaugurated until 1902.

The City Engineer of Toronto has reported on the cost of the project to construct a driveway three and a half miles long and 100 feet wide along the lake front west from Bathurst street. Cribwork would cost $225,000 and a breakwater $160,000, the space inside cribbing to be filled in with street sweepings. The engineer reports that the work could be gradually carried to completion. It is to be hoped that the project will not be lost sight of as many others of equal importance have been. Centre Island is an example of what can be done with a comparatively small expenditure each year. The proposed driveway would add in a wonderful degree to the attractiveness and popularity of the west end. Owners of property in that locality could afford to pay a special tax towards the cost of an improvement which would greatly enhance the value of their holdings.

NORTHWEST CORRESPONDENCE.

WINNIPEG, December 5, 1901.

For some time past the question of erecting a large apartment building in the city has been before the public. The proposal has now taken definite shape and is being promoted by Hunter, Cooper & Co., financial agents, of this city. The intention is to erect the building on Ellice avenue, close to Knox Church. This is a good location and not far from the main portion of the city. The frontage will be 200 feet and depth 120 feet. Mr. E. Kennedy, of Minneapolis, U. S., is the name of the architect which appears on the sketch plans.

It is intended to put up a modern and thoroughly equipped building in all points, and first-class both in construction and finish. The outline plans show a structure in the form of the letter E. The main entrance is from an open court in the centre between the two arms of the letter, and is carried up to the second story, the doorways being flanked on either side by massive columns and pilasters of stone supporting a stone entablature. The building is seven stories in height above the basement, with an eighth story over the centre portion. The facade is to be of red pressed brick with diagonal work of a darker colored brick for the first two stories, Bedford sand stone dressing to windows and other openings, with a generous treatment of carved and ornamented work.

From the main hall, entrance is obtained to two large electric elevators, one on each side of the entrance, running from basement to top flat. The main or public corridors branch off on either side of this entrance, and at the turn or arms of the letter E the main stairs are located, one flight at each arm between brick walls. This arrangement is followed out on each floor. Private halls lead off the public corridors into the various suites of rooms. Each suite of rooms or household apartments contain dining room, parlor, library, kitchen, three chambers and bath room. All these rooms—in fact, all the rooms in the building—are lighted from the outside, the use of light wells being done away with. Some portions of the floors are to be laid off in smaller suites, such as bachelor apartments, doctors' or dentists' offices and artists' studios, the whole building having about 500 rooms.

Each suite of rooms as may be required will be provided with spacious cupboards, linen closets, store rooms and pantries, with cold storage section to be operated by an ammonia process located in the basement. Dust chutes when necessary from the rooms and floors descend to the basement and these will be of the most approved pattern.

The floors will be of fireproof construction throughout, overlaid in private halls and rooms with hardwood flooring, and the corridors will be paved with mosaic.

The bath rooms will be provided with enamelled baths, Syphon jet closets and marble wash basins, having hot and cold water, the sanitary arrangements being complete in all details.

The lighting, heating and ventilation will be of the latest description. Electrical heating is under consideration, as electricity will be supplied in the near future by the water power at Spruce Falls, sixty miles from Winnipeg and at a very reasonable rate.

The eighth story over the centre portion of the building is to be arranged for a restaurant, having general and private dining rooms with all the modern conveniences attached to same.

The basement is laid out for lockers, store rooms, bicycle rooms, etc.

The estimated cost of the completed building is $175,000, and if the plan is carried out as outlined it will be an enterprise of no mean order as well as an ornament to our city and will largely take the place of first-class hotel accommodation which is at present very deficient.

The past season has been one of substantial progress and activity in the building trade. Many large and handsome structures have either been begun or completed, and we find our city is so much the richer, not only in bricks and mortar, but also in architectural adornment. Building permits covering buildings completed or uncompleted have during the past year been issued to the amount of about $1,500,000.

At the south east corner of Main and Lombard streets, the Merchants' Bank of Canada are erecting a massive and handsome structure to be used for their banking business and for general commercial offices. The walls are up to the roof line and it is proposed to close the building in for the winter and complete next year. The structure is seven stories in height above the basement. The base for about five feet above the pavement is of grey granite and above this to the height of the banking floor the two fronts are of white sandstone. From this point to cornice line red pressed brick has been used with a liberal proportion of white sandstone in ornamental and constructional work designed and detailed in the Renaissance style. The columnar effect just below the main cornice is very striking. The Roebling system of fire-proof construction is to be used for floors, etc. It is by far the highest building here and when completed will form one of the most attractive architectural features of this progressive metropolis of the West.

Other banking corporations have not been behind in providing adequate and attractive buildings for their headquarters. During the year the Bank of Commerce, Dominion Bank and Bank of Hamilton have each shown their faith in the present and future prosperity of this land of promise by expending large sums of money in the completion of beautiful and stately edifices. The Bank of Commerce building is designed after the Corinthian style, constructed of light sandstone. Carefully designed and well executed details mark this structure as one of classic outline both as to elevation and internal arrangement. The banking room is lofty and a circular treatment has been adopted for the banking counter.

The Dominion Bank is modelled after the Renaissance style in red sandstone and terra cotta and is situated at the south-west corner of Main street and McDermot avenue. The general elevation is not as pleasing in outline as we could have wished and for a corner building is in our judgment, not high enough. The banking room is very lofty, but has somewhat of a cramped appearance. Excellent taste has been displayed in the elaborate finish of the entrance corridor.

The Bank of Hamilton building has been extended this year, doubling the size. The facade is of white brick painted, ornamented with red sand-stone trimmings in bold detail, making an imposing structure at the south-east corner of Main street and McDermot avenue. The internal finish, which is quartered oak, is to be completed this winter.

The Lake of the Woods Milling Co. have erected on McDermot avenue, in the rear of the Dominion Bank, a solid and commodious office building 2 stories in height, designed and executed in brown and red sandstone and pressed brick. The walls are lined and the partitions formed of hollow terra-cotta brick. The floors are fire-proof. The internal finish is to be of the best.

A local syndicate has erected at the corner of Albert street and McDermot avenue an apartment block called "The Alexander." The lower portion is divided into stores with plate glass fronts. The super-structure is of solid brick veneered with dark red pressed brick ornamented with buff stone trimmings. The two stories above the store fronts are almost entirely carried on steel beams supported by iron columns. The face wall above the window openings is carried by steel lintels, so that there is a continuous line of brick without arches. The two upper flats have been arranged for small suites of rooms, such as bachelor apartments. These are well planned and fitted with all necessary sanitary improvements.

The School Board have erected in Nena street, at the head of Notre Dame avenue, a large and handsome solid brick school of 12 rooms, with pressed steel ceilings. The building is complete in all sanitary and other appointments.

The Toronto Crematory Co. have just completed for the city a large crematory, having 3 furnaces with water grates. The chimney for carrying off the gases is 80-feet high. Tests are just now being made as to the efficiency of the furnaces to completly destroy garbage and other like material.

Winnipeg has grown and is still growing. The foregoing is but a glance at a part of what has been done.

Space would not permit to give a detailed list of the many wholesale warehouses, stores, commercial buildings and dwelling houses which have been erected during the year; suffice it to say that the expansion of trade and general financial advancement of the city fully warrant the outlay, and we look forward to the coming year as one of still greater expansion.

The premature cracking of varnish is due, more often than not, to iuquality of elasticity—to oily or improperly adjusted undercoats. Apply color that dries quick enough to become hard before varnishing over it, and so far as that color is concerned there will be no shrinkage sufficient to disrupt the varnish.

STUDENTS' DEPARTMENT.

THE TRUE AIM OF THE ARCHITECT.

There was much sound advice expressed in admirable style in a recent address, "To the Younger Generation," which Mr. Heathcote Statham delivered before the London Architectural Association School of Design. At the outset he exhorted his hearers not to accept the pessimistic views of those who maintain that all architecture is a sham and a worked out thing now, and that nothing but an entirely new beginning on a new basis can revive it. Architecture is no worse off now than it has been at any time since the Renaissance, as far at least as its higher possibilities are concerned. It is true that it is on a radically different basis since the Renaissance ; but we cannot help that. The Renaissance theory of architecture is not so contemptible after all. It might even be argued that it is the higher theory ; that we have exchanged the pursuit of architecture as a craft for its pursuit as an intellectual problem and we have developed in these latter days much more power of invention and much more sense of character in decorative detail than the men of the Renaissance possessed.

The lamentations made by what may be called the socialist school of critics over the supposed death of architecture are to my mind as unreal as their remedies are unreal. Architecture is not a dead art unless you choose to make it so. The more earnest and enthusiastic of the younger generation have had it so preached to them that architecture is dead, and that copyism has killed it, that they are all on the qui vive to do something original, as they think ; something picturesque ; something out of the common. Hence all kinds of vagaries—short stumpy columns, windows in unexpected places, immense rustications enclosing half the shaft of a column and leaving the other half bare, and so on. These devices do impart what is called "character" to a building, no doubt, as long as they are novel ; but one very soon gets tired of them. It is possible to be picturesque, no doubt, without being eccentric ; but it is a question whether the picturesque is the true object of architectural design. The picturesque, really and truly, will only come unsought ; a sought-out and carefully contrived picturesque defeats its designer's ends. A good deal of the work which an architect is called on to do in practice has not, unfortunately, much relation to art in its higher or intellectual sense. The whole thing is mixed up with practical requirements, sometimes of a very prosaic order. But when we can get the opportunity to contemplate and treat a building, large or small, as a whole ; a building the uses of which are associated with some of the higher objects of our lives—with the repose and sanctity of life, as in the house—the aspiration to higher life, as in the church—the dignity of corporate life (or, shall we say? the dignity which it should have) as in a municipal building ; in such cases it is the part of the architect to make of his building an embodied idea—a conception which should be whole and complete in itself ; a leading idea, pervading first the plan and expressed with the same completeness in the design. This is where I think that architecture is or can be still a living art. It is all very well for the pessimists to accuse modern architecture of being only a copied architecture, making use of the detail of preceding styles ; it is not within the power of man to avoid that, except to a very limited extent. Even before the Renaissance made such a radical change in the situation, the detail in each generation or in even fifty years, depended largely on that of the preceding fifty years.

It is in this matter of unity and completeness of idea in architecture that I think we get a valuable lesson from some of the Renaissance architects. What strikes one in the works of Inigo Jones and Wren especially, as compared with most modern work, is the manner in which they grasped the conception of a building as a whole, and subordinated everything else to a central idea. Every church of Wren's, for instance, is a distinct conception with a dominant idea of its own. The details they used were to a great extent borrowed (though Jones put some originality into his), and the decorative details, in Wren's buildings at all events, are often not good, and perhaps he was not much responsible for them; but their general conception of a building was nearly always fine and always complete and consistent with itself ; an architectural whole. The pessimist critics deny that architecture is anything but building, and are always dinning into us that drawing is not architecture. It is not ; but it is a means of showing and putting on record an architectural conception. An idea in architecture is an idea, whether carried into execution or not. As to the use of the detail of a past style, probably the wiser course, and the one that is most in accordance with the actual tendency of architecture in the past, is not to throw overboard the historical detail, but to regard it as a basis for gradual development and modification, little by little, as we find opportunity ; which is the way in which all the changes of style in the pre-Renaissance period really came about. They were not the result of sharp and sudden and wilful change, but of gradual modification.

Coming to another point, not to scruple to find fault with an old building because it is old, Mr. Statham said there is a weak tendency among modern architects to admire everything in an old building, instead of considering it on its merits as they would a modern building. Then the next thing to this blind admiration is blind imitation. The designers of old buildings were subject to human error like ourselves ; and a study of them critically, considering what are their merits and what are their mistakes, is far more useful to our minds than accepting everything as right because it is old. Two other reflections were added in concluding, first not to be sure that you are right in architecture and everybody else is wrong. There is a tendency to this among our young architects, partly arising, perhaps, from the fact that our aims at present are rather uncertain and conflicting.

The other observation is to make perfection in architecture for its own sake an object, and not for what you can get out of it. If those who make the love of the art rather than the desire of gain their first object—if they must be content to see others richer than themselves in bankers' balances they have the compensation of keeping their youthfulness of spirit and their appreciation of the beauty of life.

The demand for paints and varnishes is said to be greatly increasing in Japan. Formerly, stains were principally used for all timbers used in the construction of buildings, but of late the application of oil paints is coming more and more into favor.

AMERICAN AND CONTINENTAL HEATING PRACTICES AND APPLIANCES.

A writer who signs himself a member of the Royal Institution contributes the following on this subject to the London Plumber and Decorator :

We are apt to look to America for improvements and go-aheadness in heating, and we do not look in vain by any means; but how few know, or even think, that on the Continent, in France and Belgium, and only a few hours from London, steam heating systems are erected in business premises and in private residences in a more advanced and perfect manner than America can boast of. In these countries so near home the valves to steam radiators can be worked to control the supply of steam and regulate the heat to the greatest nicety, whereas, in adopting American methods, the radiator valve has to be full open or quite shut ; regulation of steam supply and heat is not possible. These remarks refer to the ordinary methods practiced in each country. England, it must be said with regret, is, in a general sense, behind both.

America is the home of the radiator, and it may even have originated there. Certainly the practical and pretty designs came to England from that country, and two or three (no more) English makers were stimulated to set to work and improve on what had served our purpose in the past. They have succeeded in this, but radiators of American manufacture still sell in this country by the thousand feet for every hundred feet of the home made article. The lesson to be learned from this is that more can be done by our manufacturers, but it needs funds, skill and smartness all on a liberal scale.

We had radiators in England before America invaded our trade, and the same radiators are still made and sold, but they had simply to subside into the rear when the others came, and there they remain. The demand for radiators in this country is worthy of a big effort, for it is an established demand and must grow greater. Radiators must be of a style or character which will serve to make them pleasing, or at least, not unsightly in nice rooms. It is in this that our rivals have succeeded chiefly.

The coming of the American radiator has been a blessing in disguise, quite apart from its stimulating our manufacturers. What it has done is to greatly stimulate the calling of the heating engineer. Residence work is now quite common and to be readily obtained, compared to what it was previously. The radiator has made this mode of affording warmth more acceptable, and, not least important, it has made it cheaper for given results.

Not only has America sent us its radiators, but the valves and fittings, the "trimmings," as they call them, have come also. They brought us the angle-valve and the union-elbow, two details to be grateful for, allowing, as they do, for very neat and unconspicuous connections at the radiators. They also brought us the floor plates and many little details which are gradually melting the average woman's opposition to a hot water heating plant in a house. It will not do to make the appliances and the work savour so strongly of the engineer's shop and the foundry. This has been a blight, dwarfing the growth of the industry ever since it originated. The Americans undoubtedly cured this.

It was America that we had first to thank and then to hate for the malleable fittings. They are pretty, strong, businesslike and of admirable shape. In the latter respect they are very superior to our wrought fittings. They tap them with a thread that stands up clear of the body metal, and this thread is tapped taper. It would be difficult to make a bad joint. In addition to ordinary shapes they gave us the 45 degs. branch, the bushing, the eccentric reducing socket, and ditto bushing, the close and open return bend, the male and female elbow and other things. What they have not given us is a guarantee that the fittings shall be water-tight. It is simply distressing.

An English firm has remedied this, and are now making a very high quality malleable fitting which is reliably waterproof always, but, how strange it is ! they have actually copied the two faults that wrought fittings have, and are obliged to have, and they have made the price the same as wrought fittings. The three things making malleable fittings desirable are therefore absent, and it is reasonable to ask what is to be gained by using them compared to wrought ? Simply nothing. Some unnatural people would say this was just like English manufacturers.

Like the radiator, the American boiler has stimulated our manufacturers, for we were sadly behind in getting a large area of heating surface in a moderate compass. A cast iron structure can have corrugated surfaces, heat absorbing pins, complicated flue-ways, and every conceivable means of catching the heat to an extent that is impossible with wrought iron. In the past our boilers were wonderfully plain, and reliance was placed in carrying the flame up and down their sides, which were made as long as possible.

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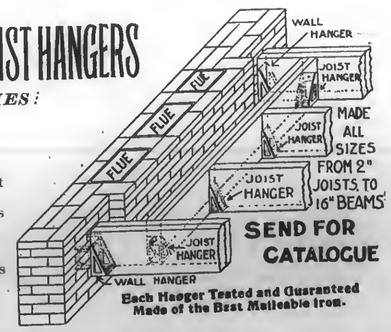

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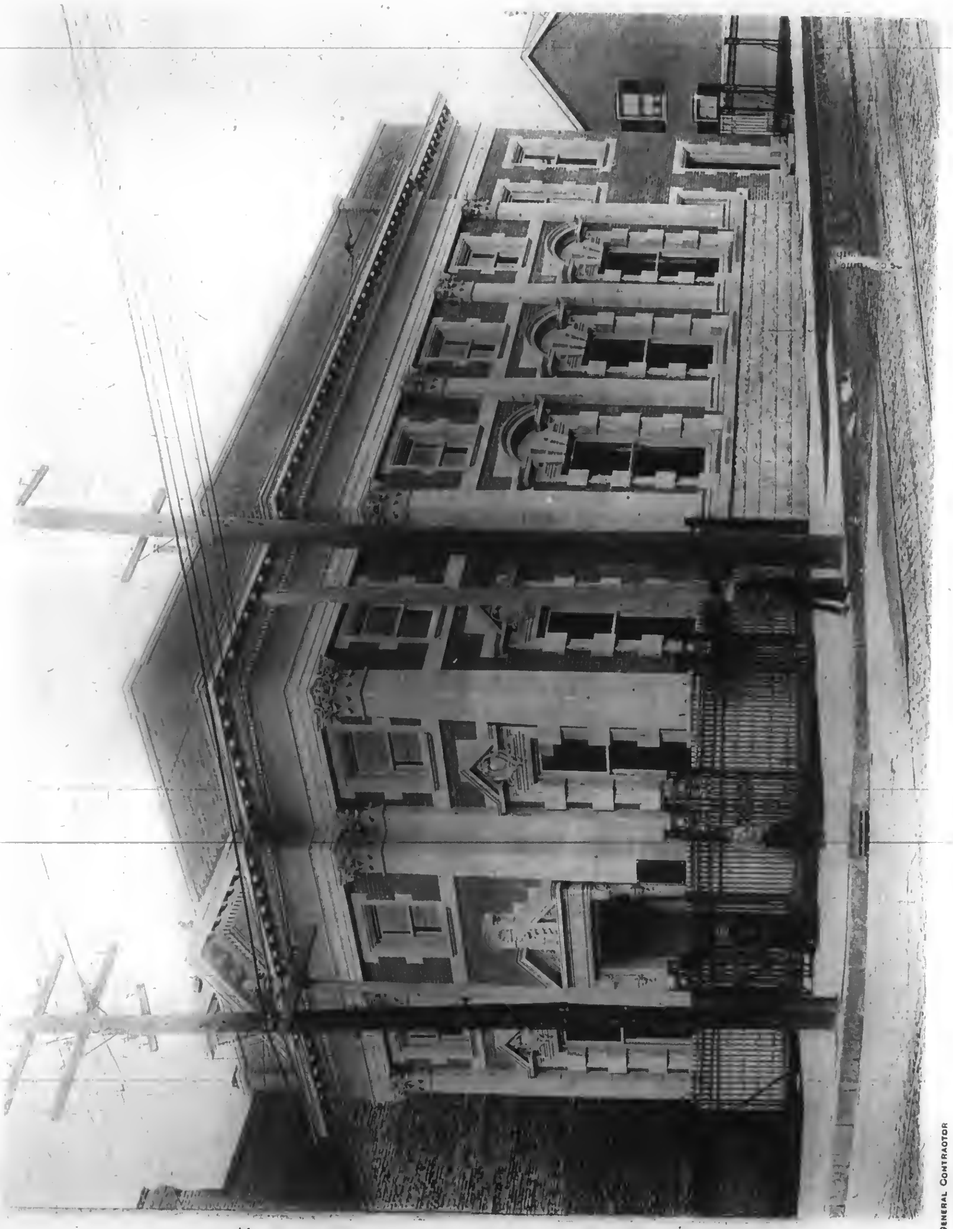

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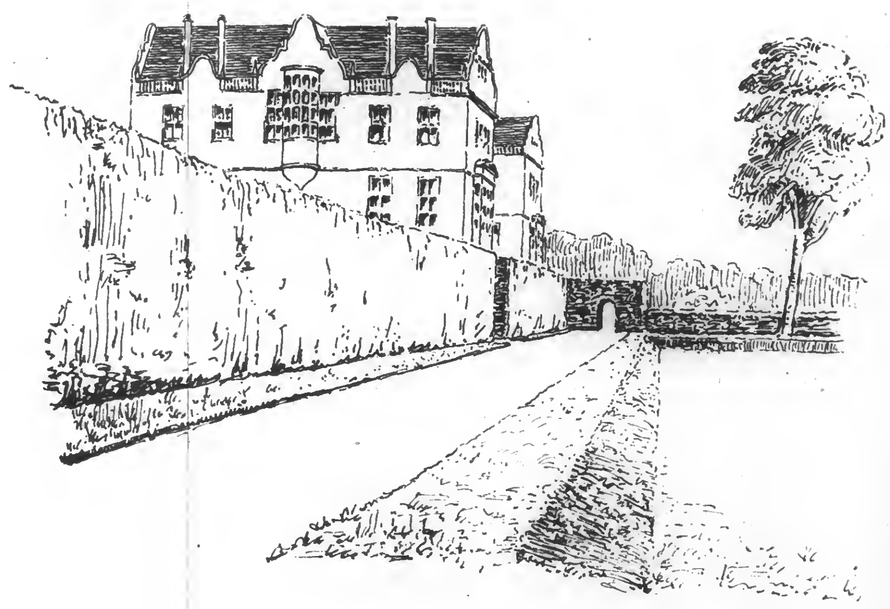

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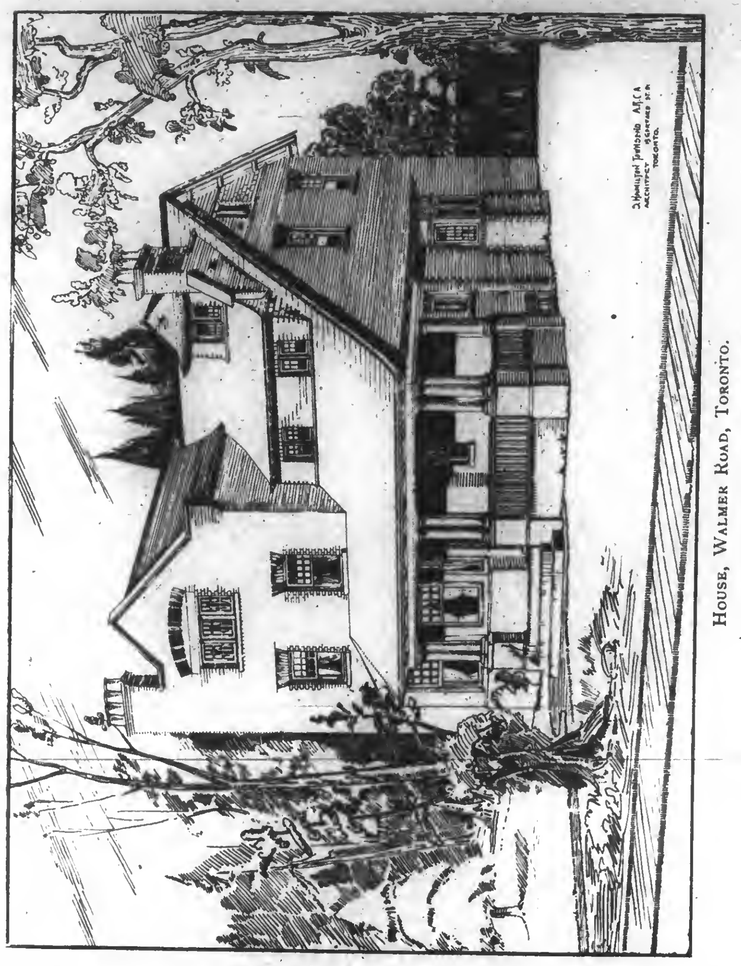

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INDEX

Architecture, University Training in ..9, 10, 11, 12
Architecture, Women Practicing - - 34
Architecture, British, Canadian, and United States - - - - - - 36
Architects and Landscape Architecta - 82
Architects—Are they a Commercial Necessity? - - - - - - 97
Architects' Work, Adding to - - - 98
Art—Count Tolstoy on - - - - - 103
Architectural Matters in Toronto - 164
Accidents on Buildings - - - 39, 40
Architects' Assistants - - - - 177
Architecture, Government - - - 178
Architecture, Originality in - - - 180
Architecture of Toronto - - No. 12-x

Brick, Silicate - - - - - - 27
Blocks, Hollow Building, Tests of Strength of - - - - - - 41
Bath Tubs, Glass - - - - - - 54
Blocks, Terra Cotta - - - - - 56
Bricks, Glass - - - - - - - 107
Builders, A Suggestion for - - - 107
Brick Work, The Wasting Away of - 119
Brick Laying, Rapid - - - - 119
Brick Laying Machine - - - - 120
Building in Greece - - - - - 121
Brick Manufacturers, Losses by Frost - 123
Brick Work, Engineering - - - 123
Bricks, Table Showing Number of in square foot of Surface Wall - - - - 139
Builders Exchange Winnipeg - - 139
Beams, Rolled, Development of - - 167
Building Department Toronto - - - 1
Building By-law Toronto - - - 34, 145
By the Way No. 3-ix, 68, 95, 111, 132, 174 189
Brick Laying in England and America - 50
Blocks, Hollow Building - - No. 4-xi
Builders Exchange, Victoria, B. C. - No. 5-xi
Building Conditions - - - - 112
Bricks, Fireproof - - - - - 126
Bricks, Uniform Size for - - - 130
Building Site, Establishing in Law a - 145
Business Opportunity, A - - - 161

Contractors Memory Jogger - - - 8
Ceilings, Curios - - - - - - 38
Concrete Construction in Building - - 42
Cement Buildings - - - - - 54
Contractor, A Lady - - - - 56
Concrete Buildings - - - - 121
Cement, How to Determine the Value of - 124
Case Making, Air Tight - - 134, 135, 136
Ceilings, Papering - - - - - 150
Contracting Device, An Ancient - - 154
Contractor, Requirements of a - - 169
Cement, Cost per Barrel to Manufacture - 182
Cement, Portland, Annual Consumption of in the United States - - - - 182
Canadian Society of Civil Engineers - No. 1-x
Cathedral Architecture in England - No. 2-ix
Correction - - - - No. 3-xii
Cities, The Beautifying of - - - 34, 50
Cement, Portland, United States Competition in - - - - - No. 3-xii
Convention, Builders - - - - 50
City Improvement - - - - - 50
Crematorium, Mount Royal - - - 64
Competitions, Architectural - - - 66
Coronation Stone - - - - - 66
City Commissioner, Toronto - - - 97
Campanile of St. Marks - - - 98, 99
Concrete, Expansion of - - No. 7-x
Cement Blocks - - - - - 113
Campanile, The Fallen - - - - 114
City House Exteriors - - - - 130
Coal Famine, Some Possible Results of the 140
Contracts, Profitless - - - - 162
Competition, Students' - - - 162, 177
Canada's Development - - - - 178
Cement Tests, Standard Portland - - 172
Contract Conditions - - - No. 11-xii

Decoration, Wall, Subjects for - - 26
" Color and its Application to - 57
Dry Rot in Dwelling Houses - - - 72
Damp Surfaces, Methods of Treating - 153
Dare devilries, Workmen's - - - 154
Decoration, Sanitary - - - - 168
Demolition Methods - - - - 171
Dick, D. B., Complimentary Dinner to - No. 3, page xiii
Device, A Time Saving, for Contractors and Architects - - - - 147

Education of the Carpenter - - - 6
Elastic, The Limit - - - - - 27
Exhibition, The Toronto - - - - 1
Examinations, R. I. B. A., - - No. 1, p xi
Exits, Theatre - - - - - - 18
Exhibition, Toronto Industrial, Improvement of Grounds at - - - - 29
Exhibition, Architectural - - - - 83
Education of Architects - - - - 82
Exhibition, Colonial, Stone at the No. 6, xii-xiii
Exhibition Building, The Toronto - - 114
" A Japanese - - - No. 8-xi
Education, Technical - - - No. 8-xii
Exhibition, A Dominion - - - - 131
Exhibition, Toronto, Notes of - - No. 9-ix
Explosive, Smoke as an - - - - 162
Employers and Employees, Relations of - 185
Exposition, Louisiana Purchase, Buildings under Construction for - - - - 188
Elevator, the Electric - - - - 191
Esprit de Corps - - - - 161, 162

Fir, Douglas, Tests of - - - - 38
Foundations, Loads on - - - - 44
Flooring, Ancient Methods of - - - 44
Floor, Painting a - - - - - 121
Floor Plans, The Naming of - - - 17
Fire, The Park Avenue Hotel - - - 45

Fireproofing, Material and Methods - 45
Fire, Lessons of the Park Avenue Hotel - 64
Fire Resisting Construction - - - 65
Foundations on Quicksand - - - 93
Flat Iron Building - - - - - 114
Fences, Brick - - - - - - 129
Fire Resisting Rules, British Standard No. 11, x, xi
Foremen, Builders' Qualifications of - - 184
Fireproofed Wood, Experiments with No. 12-ix

Glazing, Cost of - - - - - 57
Gas Pipes, To Prevent the Freezing of - 119
Glass, Stained American - - - 2, 3
Glass, Stained - - - - - - 132
Grand Stands, Construction of - - - 59
Gargoyles, The - - - - No. 9-xii
Glass as a Fire Resistant - - - 161

Heaters Connecting Domestic Water - 139
House that Jerry Built, The - No. 4-ix
Heating Apparatus, Hot Water, Boiling of Water in - - - - - 125
Heating Methods—Will the Coal Famine Affect - - - - - - 148

Intercommunication - 5, 6, 21, 22, 37, 53, 69, 85, 101, 117, 118, 133, 149, 165, 166, 181
Iron, Structural Painting - - - 153
Iron, Weight of - - - - - 155
Insanitary Buildings - - - - 161

Legal - 28, 58, 76, 107, No. 8, ix, 143, 187
Legends and Curiosities, Building - - 44
Lightning, A Photograph - - - 124
Lumber, Narrow Advantages of - - 139
Lifting Heavy Stone, Ancient Methods of No. 3-xi
Library Design - - - - - 51, 52
Laths, Spruce - - - - - - 65
Labor Conditions - - - - - 66
Loads and Working Stresses for Building Work - - - - - 78, 79
Labor Union, Fixing the Responsibility of - 145
Legal Point, A - - - - - 158

Mortar, Portland Cement - - - 43
Marble, Treating - - - - - 43
Mexico, Expensive Building in - - 104
Monolith, A Forty Ton - - - 107
Mortar, Experiments with - - - 121
Mortar, Adhesiveness of - - - 171
Montreal Correspondence - - - 3, 4
Montreal, Building in - - No. 1-xi, 109
Montreal Silicate Brick Co. - - No. 7-ix
Mistakes in his new house - - No. 6-xi
Municipal Bungling - - - - 113
Materials, Building, Production of, for 1901 - - - - - No. 10, ix
Merchants' Bank of Canada, Winnipeg - 175
Mortar - - - - - - - 185

Now and Then - - - - - - 168
Newfoundland, Stone Resources of - 170
New South Wales, Some Lessons from - 49
North West Letter - - - 61, 160
New York Stock Exchange Building - 99, 100
Newfoundland, Slate Industry of - - 109
Notes No. 1-x, No. 2-x, 48, 62, 64, 73, No. 5-ix, xi, No. 6-ix, No. 9 xi, xii, No. 10-x, xi, xii, No. 11-xi, 186, 187, No. 12-xii

Obituary—R. C. John Dunn - - No. 4-ix
Office Management - - - - 179
Ontario Association of Architects 2, No. 12-xii

Publications - - - - No. 1-xii, 141
Principle and Method - - - - 35
Permanent Pavements, Apportioning the Cost of - - - - - - 47
Photographic Exhibition - - - - 81
Permits, Building - - - - - 82
Photographs, Architectural Exhibition of No. 6-ix
Paints, Black, for Heated Surfaces - - 109
Province of Quebec Association of Architects 129
Personal - No. 1-xi, 63, No. 8-xiii, No. 9-x
Philanthropic Enterprise - - - 154
Paint, Blistering of - - - - 42
Plumbing Business, The - - - - 55
Plumbers Association of Ontario - - 56
Paint, Peeling of on New Spruce Timber - 57
Piers, Masonry, Tests of - - - 74, 75
Plaster of Paris, Use of - - - 86, 87
Porches, Best Flooring for - - - 106
Planning, Close - - - - - 177
Plasterers' Grievances - - No. 12-xiii

Queen's University Kingston - - - 30

Radiator, An Electric - - - - 57
Red Lead and Linseed Oil - - - 122
Roofs, Timber - - - - 137, 138
Records of Cost, Importance of - - 151
R.I B.A. Colonial Examinations - - 115
Regulations, Building - - - No. 8-x

Strikes, Method of Preventing - - 26
Specifications, Carelessness in - - 26
" Uniform - - - - 27
Steeples, Cost of - - - - - 27
Slag, Crushing and Blast Furnace - - 44
Steel and Iron, Protection of - - 102, 103
Stone Working, Wire Saw and Pneumatic Chisel in - - - - - - 104
Scaffolding, Excessive Loads on - - 120
Strikers, A Warning to - - - - 124
Stone, Undercutting - - - - - 152
Schools, Manual Training - - - - 154
Steel, Behavior of, under stress 12, 13, 14, 15, 16
Stone, Canadian Building - - - 18
Sewerage, Disposal of in Suburban Houses, Etc. - - - - - - 19, 20
Shingling Brick and Stone Walls - - 33
Students' Dept. - - - - No. 3-x
Stone, The Decay of - - - - 65
Steel Construction, The Dangers of - - 65
Specifications for Painting Iron and Steel - 80
Schools, Correspondence - - 81, 82
Steel Frame, Durability of the - - 83
Specification Masonry - - No. 6-x
Strike, The Toronto Plumbers - - 98
South African Trade - - - - 116
Strike, Peculiar Cause of - - - 116
Stone, Building, in the North-West - 130
Structural Work in America - - - 141
Sewage Disposal on Vessels - - - 144
Store Front, Patent - - - - 162
Stock, Care of - - - - - 174
Stones, Building, of Nova Scotia - 183
Stones, Building, of Nova Scotia - 190

Toronto Builders' Exchange - - - 7
Tiles for Slates in China - - - - 25
Tenders, Errors in - - - - - 120
Trees, Winter Transplantiog of - 17, No. 4-xi
Theatres, Safety of - - - - 33
Tenderers, Justice to - - - - 50
Toronto Architectural Eighteen Club Exhibition - - - - - 83, 84
Toronto Island Park - - - - 114
Tariff, The Preferential - - - 129
Tomb, An Architects' - - - - 156

Useful Hints - - - - - 59, 124, 155
Underpinning and Lifting a Nine-Storey Wall - - - - - - 105
Union League Club House - - - 17

Veneer, The Making of - - - No. 9-x
Ventilating Dwellings - - - - 120

Walls, Hollow, With Iron Ties - 22, 23, 24
Wrecking, Building - - - - 42
Woods, Determining the Hardness of - 44
Walls, Prevention of Damp in - - 70, 71
Windows, Weather Tight - - 88, 89, 90
Walls, Dampness in - - - - 91
Wall Covering, Canvas, How to Hang - 92
Wages, Advance in - - - - 123
Walls, Stability of in Case of Fire - 97
Walls, Hollow, Artificial Stone - No. 9-xi
Wiring, Electric, Safety of - - 1-

ILLUSTRATIONS IN TEXT.

An Architects' Tomb - - - - - 156
Block Plan of Buildings, Kingston - - 30
Cottages in Connection with the Sanitorium, Gravenhurst - - - - 32, 46, 47
Canadian Building at the Wolverhampton Exhibition - - - - - 45
Canadian Pavilion at Wolverhampton Exhibition - - - - - - 125
Cottage for Wm. Wadds, Rossland, B.C - 77
Designs for Buildings for Louisiana Purchase Exhibition - 103, 105, 108, 188
Plan for Re-Arrangement of Toronto Industrial Exhibition Grounds - - - 29
Portion of Chimney Hood - - - - 67
Pair of Semi-Detached Houses, Toronto - 94
Plans for a Moderate Cost House - - 152
St. Paul's Presbyterian Church, Brandon, Man. - - - - - - 60
St. Joseph's Church, Brighton, England - 140
Wesley Methodist Church, Vancouver, B. C. No. 5-x

ILLUSTRATIONS.

Accepted Design for Art Gallery, Toronto Exhibition Grounds - - - No. iii
Branch of Dominion Bank, Toronto - No. xi
"Carnegie" Public Library, Windsor, Ont., Proposed - - - - No. vi
Design for proposed residence, Toronto - No. ix
Design for proposed residence, Toronto No. xii
House and Stable at Wenham, Mass. - No. v
House at Cold Springs Harbor, Long Island, N. S. - - - - No. vi
House on Bismarck Ave., Toronto - No. viii
Houses on Spadina Ave., Toronto - No. ix
Interior - - - - - - No. v
Interior of St. Annes des Plaines Church, Quebec - - - - - No. vi
Lectern, Design for - - - - No. vi
Queen's University, Kingston, New Buildings - - - - - - No. ii
Physician's Office and Residence, Toronto No. iv
Pair of Semi-Detached Houses, Toronto No. x
Residence, South Drive, Rosedale, Toronto No. ii
Residence of Mrs. Frank Fleming, Toronto - - - - No. vii
St. John's Church, East Toronto - No. i
St. John's Church, Toronto - - No. x
Two houses in Toronto - - No. xi
William Davies Building, Toronto - No. xi

The Canadian Architect and Builder

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ILLUSTRATIONS ON SHEETS.

St. John's Church (Exterior and Interior) East Toronto—R. J. Edwards, architect.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Photogravure Plate—Entrance to West Transept, St. James' Cathedral, Toronto—Cumberland & Storm, architects.
Photogravure Plate—Fontana di Trevi, Rome—Designed by Niccola Salvi
House on St. George Street, Toronto—Symons & Rae, architects.
House in East Toronto—R. J. Edwards, architect.

CONTENTS

Toronto Building Department 1
The Toronto Exhibition 1
The O. A. A. Convention 2
American Stained Glass 2
Montreal Correspondence 3-4
Ontario Association of Architects Convention . . 5-20
Canadian Society of Civil Engineers x
Method of Heating a London Theatre x
Personal xi
R. I. B. A. Examinations xi
Building in Montreal.

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Toronto Building Department

There are signs of an approaching change in the City Commissioner's office in Toronto, and it would be well to consider the question of changing in a fundamental manner the whole administration of building inspection. At the present stage of the city's growth, and even more in consideration of the growth that is coming on, it is important that the Department should be a Department of Architecture, and that the head of it should be an architect highly trained in modern methods of construction, and able to keep up with new ideas. A permanent official of this character, to amend and keep amended the building by-law, and to carry it out intelligently, would be worth a good salary for he would represent great possibilities for the city. It is essential to have a man who is big enough to be at ease under his responsibilities, or the authority given to him will degenerate into a wretched administration of red tape. But if he is big enough he will do much to foster a good class of building in the city.

The Toronto Exhibition

The Exhibition by-law of Toronto having become law, brings into the region of realities the problem of improving the Fair grounds. The argument for the by-law was that a successful Fair is an advantage to the city, and for this purpose new buildings were required. The main building was not rain proof, and the first consideration, which outweighs all others, is therefore plain and practical—to protect the exhibits; and if the building is made fairly presentable, as the plainest and most practical member of the Exhibition Association will desire it to be, so much will have been accomplished, as compared with the present state of affairs, that the Association may reasonably rest from its labors and say that, as the Exhibition did well before, now, with new and improved buildings, it is safe. But the attractiveness of a Fair from the point of view of beauty, which is already accepted as essential to success, does not depend only upon its buildings. Good buildings and large buildings are essential to give adequate motive for the scene, and an imposing background; but the beauty and the real attractiveness of the Fair lies in the way the buildings are placed and the treatment of the spaces between them. Here is a field for the sort of charm that makes the Fair a sort of recreation ground for visitors, who care little about the exhibits. The possibilities are great and varied, and cost, in comparison with the buildings, little but thought. What can be done to improve the grounds as well as the buildings? To hold its own the Fair must meet the taste that has grown up for this sort of thing. It is not really in a safe position if only the buildings are improved. The difficulty is in the number of fixed conditions that exist. But the alterations that are to be made, and in particular the

condemnation of the main building, open up chances that a good landscape designer might turn to good account; and before the ground plan of the Fair is fixed for another period, by the erection of the new buildings, the block plan should be carefully considered by the architects, if necessary with expert assistance. In all important undertakings in which the treatment of grounds is involved, the best results appear to proceed from a joint committee of architects and a landscape architect.

The O. A. A. Convention

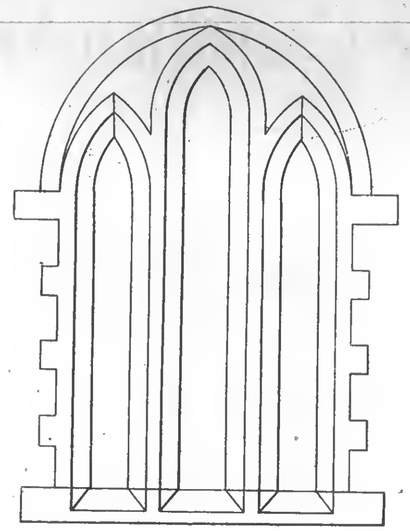
The annual meeting of the Ontario Association of Architects was attended, with three exceptions, entirely by Toronto members. The meeting was entirely harmonious and there were indications of increased sympathy with the educational objects, which were a principal theme of the Convention. The Council and Committees have evidently done a good deal of work during the year in arranging the scheme of subject matter and classes, and in actual tuition. The principal lack appears to be in students. The wedding is ready but they that are bidden appear to be not worthy. It seems a pity that there is no power to compel them to come in. If the special committee of the Legislature, which threw out the bill to make membership of the Association the only way to practise architecture had attended the meeting on Tuesday afternoon, they would perhaps think that an Association which has kept on its educational work without the powers it asked for might well have been entrusted with those powers.

There was no doubt nothing altogether new in the papers of Prof. Capper and Prof. Laird. If there had been we should perhaps have had less cause to praise them. They represented the standard ideas of the present time in their subjects; speaking with authority, as men in a position to know, and in a position which requires them to know, what are not only high but practical aims in these matters. They helped Toronto efforts in the way of confirmation and encouragement from without, and the Association did well in inviting others than members of the Association to come and hear them.

AMERICAN STAINED GLASS.

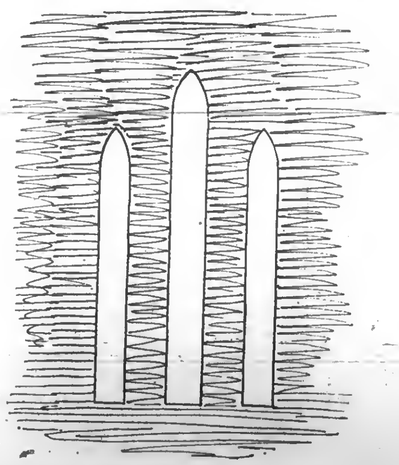
Is American stained glass an improvement to a church? A window has recently been inserted in St. James' Cathedral in Toronto, which raises the question acutely. The disagreeable wall-eyed appearance the opalescent glass gives on the outside is a general objection to the use of American glass, but in the case of St. James' there are particular reasons why, for considerations of inside effect, it should not be used. One of the beauties of this church is the abundant light coming from the aisle windows, which light indeed is a necessity, for the nave seats are dependent upon it.

If the scheme, of which the new north east aisle window is a beginning, is carried out, this characteristic of St. James' will be gone, and we shall have instead an area of gloom provided apparently for the display of a series of illuminated pictures along the sides of the church. The practical discomfort will be intolerable, but it is the artistic loss that is to be most deplored. Any one looking at the church with a seeing eye can even now note the difference between the present effect and a future in the gloom of American glass. The shafting of the columns and the lines of the woodwork are now touched with light from the aisle windows so as to delight the eye. The carving of the cedar organ cases was beautiful under the side light that each received. Now only one is touched with light; the other under the immediate influence of the new window has



lost that charm; indeed the carving is not strong enough to stand the test of dull and diffused lighting.

One can but look forward with regret to the gradual extinction throughout the church of its principal source of beauty. The windows themselves will be among the features which suffer. The glass alone is not the measure of the window. The arch, inside of which the



lancets are grouped, gives the real size of the window, as intended by the designers; and it is essential to the design that there should be light enough to let the relieving arch and its quoined jambs be seen. All this will be upset if American glass is introduced, by the submergence of these details in the general gloom. The windows which it is intended to beautify will

appear unpleasantly narrow, and, the reason for the subordination of the side lancets to that in the centre not being apparent, the grouping will appear to be without reason.

The case is one of conflict between the windows and the church—which is to receive first consideration. The church ought certainly to be the object of consideration, and the first consideration in choosing glass for St. James' Cathedral is that it shall let in light. The only glass that is likely to satisfy the requirement is toned white antique English glass. Figure subjects depending chiefly upon the leading and tones of white, with colour only for emphasis and adornment, would not only shine like jewels in the church and exactly suit its architectural requirements but are eminently suited for sacred subjects. There is something in the pure tints of antique glass, and the necessity for direct purpose in their application, more suited to a religious purpose than the soft and sensuous colours of opalescent glass, and the accidental effects which are a principal object to the makers of American coloured windows. Abundance of colour is in itself no hindrance to religious feeling. The mosaics of St. Mark's are as splendid in colour as they could be made, the robes of Perugino's angels are not only brightly coloured but are lined with another bright colour, and the edges are turned over to show the lining. But in these examples the work is carefully and delicately done to beautify the object to which it is applied. The more pains it receives at their hands the more we receive an impression of serious purpose in its presentation, and the more the subject is exalted. In American work, on the other hand, the subject appears to be but a peg upon which to hang ingenious experiments in accidental effects of colour, procured by manipulating the surface of the glass. The resulting effects—mechanical and accidental—exalt the manufacture but not the subject. The technique is hampering rather than helpful to strong purpose in subject, and, in the American school of glass workers, purpose in subject is not the strong point. The new window of St. James', which represents the descent of the Holy Spirit on the day of Pentecost, seems to be better than usual in this respect, yet it is impossible to avoid feeling that it does not convey the essence of the scene it depicts There is commotion among the Apostles, but it is at something external to themselves. There is not a sign of that possession that required from St. Peter, a little later, the defence that they could not be drunk at that hour of the day. The Apostles have an air of gentle piety, devoutly regarding an apparition of The Dove, which suggests the source of the tongues of fire that are seated upon them. One of them looks round at his neighbor, which it is impossible to conceive of him doing at that moment.

Mr. Harry Simpson, architect, was a candidate for a seat at the Public School Board at the recent municipal elections in Toronto. Although failing of election, his popularity is attested by the fact that he secured upwards of 1700 votes.

The Central League of School Art of Toronto has decided to purchase five large pictures representative of different styles of architecture, together with a collection of other pictures which will be circulated among the public schools of the city.

Branch Office of the CANADIAN ARCHITECT AND BUILDER,
Imperial Building.

MONTREAL, January 17th, 1902.

The building trades in general were perhaps less actively employed than usual last year. Since the great boom of '89 Montreal has not witnessed feverish activity in building. We must take for granted I presume, that a city which has acquired a certain development and has passed the formative period, must count on extraordinary events to create unusual activity. Something like the great Expositions at Chicago or Paris would probably be necessary. As a matter of fact Montreal has but met the wants of the normal expansion of a city of its size since the street widening craze passed, and has not responded to any demands for wild and unnatural expansion.

The year 1901 stands lower in the volume of building operations than many previous years, much lower indeed than the following figures show. In 1889 eighteen hundred permits were granted. Since 1890 a notable decline has been noticeable, 1893 recording one thousand and 1894 five hundred with an aggregate value of $2,750,000; while in 1901 we have 752 permits with an aggregate value of about $2,800,000, being less than any previous year by about 25 per cent. if we remember the weakness of the former reign in the Building Department.

A great many buildings were erected then with total disregard to by-laws add without a permit being taken out, while to-day one has to be taken for a ridiculously small alteration of $30.00 as we have seen this week.

As two or even three inspectors could hardly control all buildings in course of erection in a city of the size of Montreal the new building inspectors upon entering into office established the following system which proved most effective. Every applicant on submitting his plans receives a placard or poster which he is expected to post up in a conspicuous position, together with his permit from the City Surveyor for depositing materials on the street. All policemen on duty report to the head of the district police station any work in progress without the official posters in evidence, which in turn is reported officially by the last named to the building inspector in chief.

We can further explain the steady decrease of building operations on the ground that the city is gradually filling up within its comparatively limited area. People are forced so to speak to seek accomodations in the

suburbs, such as Westmount, St. Henri, Verdun, Notre Dame de Graces, Outremont, Maissoneuve, Delorimer, etc. The proof of this is in the St. Cunegoude, where we could not find to-day three building lots within the limits of that town proper. This state of affairs has existed for four or five years, with the result that as the last census shows that municipality has hardly increased in population for the last decade.

What should be done at the earliest moment possible is the annexation to the city of Montreal of all those municipalities from Longue Point to Cote Saint Paul, which form an uninterrupted agglomeration of buildings and the whole of which is practically one city to us as well as the foreigner who sees no demarcation whatever between these several towns grouped in one of three hundred and forty thousand inhabitants.

The bulk of last year's work was certainly furnished by last winter's big fire in the business district. It is a great satisfaction to find that in most of the buildings rebuilt an effort has been made to render them less inflammable, the Constine Building for instance, immediately behind the ruins of the Board of Trade, being thoroughly fireproof. A Montrealer returning after a two years' absence would certainly not recognize old historic Saint Peter's street; the two sides having been entirely transformed or rebuilt in the lower part.

Several important buildings were erected which deserve more than a passing glance, such as the new addition to the Royal Insurance Company's building, Place D'Armes Square, seven stories high and costing in the neighborhood of $175,000. In connection with this I am glad of this opportunity to give credit to the architects, Hutchison & Wood, for the respect they paid to the architecture of the past (an occurrence so seldom met with nowadays). The individuality of the old building has been preserved by continuing the new portion on exactly the same lines. In a few years the line of junction will disappear altogether by the change of color of the new stone and make the whole an imposing unity.

The Grand Trunk Railway offices on McGill street, by R. A. Waite, of Buffalo, N. Y., costing $500,000; Carsley's new store on St. James street, by A. F. Dunlop; St. John Baptist church and a $250,000 R. C. structure on Rachel street, by J. E. Vauier; the Merchants' Bank building, additional stories, by Edward Maxwell; the Wilson residence, corner of Sherbrooke and Drummond streets, also by R. A. Waite; and the two princely residences on Drummond street, one in the style of an English manor house, for Mr. R. Reford, of the well-known steamship agency, and the other in the fashionable New York roccoco style, for Mr. Chas. R. Hosmer, of the C. P. R. Telegraph Co., by the Messrs. Maxwell, are among the most important works of the year.

But, unquestionably, the building which has attracted the most interest, is the extension to the Bank of Montreal, now being built on Craig street, at a cost of nearly a million dollars. The structure, which is about 150 feet long, faces also on its long side on Fortification Lane, its axis being exactly in the center of the the present building, extending from St. James street to Fortification Lane. As the slope of the ground is quite considerable from front to rear, (the ground floor on St. James street a few steps higher than the sidewalk), it will necessitate the construction of a bridge over Fortification Lane, uniting the two buildings, the older of which will serve as a vestibule; and a monumental one it will be, with its magnificent facade, unrivalled by any other financial institution.

The slope is such that between the main floor level on St. James street and the level of the sidewalk on Craig street, two stories are gained, which will be devoted to public safety-vaults, the main floor being entirely reserved for the banking room, 40 feet high, with no windows, the light coming from the top. To give an idea of the richness of this structure it will suffice to say that no plastered walls will be in evidence, every inch of wall space being marble, and that the 32 columns of 34 feet in height, supporting the lantern, will each cost the sum of two thousand eight hundred and some odd dollars. The shaft will be in exotic marble and the capital in cast bronze, as in the antique pagan temple of old Rome.

This again is a lost opportunity for our architects, as it has been thought fit, as in the case of many of our prominent modern buildings, to call upon foreign architects to design the structure, Messrs. McKim, Mead & White, of New York, being in this instance the fortunate firm.

The erection of the Foley apartment-houses, on Dominion Square, Metcalfe and St. Catherine streets, by Messrs. Saxe & Archibald, acceuluates a new departure in our mode of living started by the Sherbrooke apartment-house. This structure, which is pleasing in appearance, will cost in the neighborhood of $400,000.

What this year may have in reserve is hard to foretell, but from present appearances, notwithstanding what real estate agents may say, we do not anticipate a season of great activity.

It is true, there are a few other mammoth structures to be commenced in the spring, such as the Liverpool, London & Globe Insurance Co. building, corner St. James and Place D'Armes Square. The building, which will comprise seven or eight stories, was thrown open to competition among a few city architects. Afterwards, it is reported, these architects were advised not to complete their designs, as the work had been given to the makers of the conditions of competition, Messrs. Peabody & Stearns, of Boston.

The Birks Jewelry Store, on Phillips Square, will be enlarged by a considerable addition, Messrs. Hutchison & Wood being the architects.

The Guardian Assurance Company has bought the remainder of the Barron Block ground, adjoining the Lancashire Insurance Company's building, designed by Edward Maxwell, and will build an advertising structure, which, it is hoped, for the profession's sake, will not go out of a Montreal architect's office, in order to give the public an occasion once more to compare results with the American building to be commenced at the same date on Place D'Armes and St. James street.

MONTREAL BUILDERS' EXCHANGE.

The Montreal Builders' Exchange have decided to adopt the system which has prevailed among American Exchanges, of renting desk room to supply firms and allow them to display samples of their materials in cases, the object being to make a permanent exhibit of building materials within the Exchange, and at the same time to increase the revenue.

MONTREAL MASTER PLUMBERS' ASSOCIATION.

The Association held its annual meeting a fortnight ago, when the following officers were elected: Hon. president, John Date; president, Thomas Moll; first vice-president, Thomas O'Connell; second vice-president, Joseph Thibault; third vice-president, W. G. Graham; secretary, J. A. Gordon; financial secretary, J. C. Brunet; treasurer, Captain Giroux; English corresponding secretary, J. W. Hughes; French corresponding secretary, Ald. Jos. Lamarche; chairmen of committees: Sanitary, P.C. Ogilvie; Audit, J.A. Watson; Apprenticeship, P. J. Carroll.

ONTARIO ASSOCIATION OF ARCHITECTS

PROCEEDINGS OF THE ANNUAL CONVENTION HELD IN THE ROOMS OF THE ASSOCIATION, 94 KING STREET WEST, TORONTO, JANUARY 14TH AND 15TH, 1902

THE proceedings were opened at 2 p.m., Tuesday, January 14th, 1902.

The following members signed the register of attendance:

Grant Helliwell, H. E. Moore, Edmund Burke, Geo. R. Harper, W. L. Symons, A. R. Denison, J. Wilson Gray, A. H. Gregg, M. B. Aylsworth, W. R. Strickland, F. F. Saunders, W. Percy Over, C. H. C. Wright, John Gemmell, A. Frank Wickson, Wm. R. Gregg, C. J. Gibson, John A. Pearson, Almond E. Paull, R. J. Edwards, S. H. Townsend, Geo. W. Gouinlock, John Kay, Paris, M. Hall, H. C. McBride, London, Andrew Bell, Almonte, C. H. Bishop, W. A. Langton, and the following visitors: G. S. Lemasnie, Eng., C. H. Mortimer, A. H. Harkness, Alfred Baker. H. F. Duck.

The minutes of the last annual meeting were read and confirmed.

The President, Mr. Helliwell, then read his address:

PRESIDENT'S ADDRESS.

To the Ontario Association of Architects in Convention Assembled.

GENTLEMEN,—The Council having elected me to the office of President I have the very great honor and privilege of addressing you in that capacity on this, the 14th annual meeting of the Association.

The year just closed has been a most prosperous one. Throughout the Province of Ontario and indeed the whole Dominion much commercial activity has prevailed. The national resources of our country have been developed as never before, all branches of trade have been busily employed, art and science have kept pace with the general progress, and our own profession has naturally shared in the widespread prosperity.

Under these happy conditions I can greet you with most hearty congratulations. The convention in which you are now assembled promises to be one of special interest and benefit. The committee who have had the task of providing and arranging the programme for this gathering have, as you will see by a glance at the Agenda, accomplished their work with signal success. Those gentlemen who, in response to the committee's invitation, have so kindly consented to come here and address this convention, deserve and will receive, I am sure, a cordial welcome. The names are those of old friends and new and are all deservedly distinguished in their special spheres. Dr. Bryce and Professor Wright have on former occasions read papers of great value and interest, and we can therefore anticipate with much pleasure the addresses they are to favor us with. The accomplished professor of architecture in McGill University, Montreal, is well known to the profession throughout Canada. On a former occasion Professor Capper was expected to address the architects of Ontario, but through some unavoidable cause was prevented. This is consequently the first time we have been favored with the presence of Mr. Capper (who is also an ex-president of the Quebec Association of Architects at our convention.

But this is not all, the Ontario Association of Architects appreciates very highly the honor of having with us at this annual gathering a distinguished representative of the architectural profession in the great republic of the United States. I refer to Professor Warren P. Laird of the University of Pennsylvania, Philadelphia, who has charge of the School of Architecture in that University.

The Agenda informs you of the subjects on which these gentlemen will address the Convention. They are all topics of the utmost interest and value and will, I am sure, be listened to with the greatest pleasure and profit.

In addition to these papers the reports of the treasurer and registrar and of the various committees will be presented. A forestalment of these reports is uncalled for. They will speak for themselves and will, I venture to say, be entirely satisfactory. I cannot, however, refrain from testifying to the faithful and arduous year's work of the committees, and especially, if one might make any distinction, to the work of the Committee on Education.

The curriculums of studies, as prepared by the committees have been printed and sent out to the members of the Association. Two courses have been arranged, a pass course by which students may qualify for registration as members of the Association and an honor course necessitating attendance at the lectures of the School of Practical Science, Toronto.

The honor course is designed to carry the student much farther in technical, scientific and æsthetic training than the pass course. It aims to equip him in the best possible manner for the practice of architecture.

An important feature of the course is that a student may take it concurrently with service in the office of an architect. The committee, after careful study of the schedule of the class work of the School of Practical Science, and by the kind co-operation of the staff there, have so arranged the curriculum that an office student can go through the course by attending the school an average of seven hours during its sessions.

In both Pass and Honor Courses special provision has been made for that most important branch of study, "Design". In this department the student will be trained by means of Studio Classes, conducted on those methods now almost universally adopted in the architectural schools of Europe and America.

A beginning has already been made in this line and Studio Classes are now being conducted on two nights each week in these rooms. The report of the committee having this work in hand will be presented to this Convention and render it unnecessary for further comment on my part.

While dealing with the subject of Architectural Education reference should be made to the work being done in Central Ontario School of Art, in connection with which is a class in Architectural Design, attended by a number of the students of Toronto architects.

Outside of the schools, the profession and the public at large, or at least that portion of it interested in architecture, are receiving valuable education by means of the numerous exhibitions conducted by various architectural organizations in all progressive countries. It augurs well for the future of architecture that wide and increasing interest in such exhibitions is manifested on the part of the public.

The exhibition held in Toronto last winter, under the auspices of the Eighteen Club, enabled the profession and the citizens who attended to form a very comprehensive idea of the progress of architectural design on this continent, and incidentally could not fail to elevate the standard of public taste in matters architectural.

A lecture delivered in Toronto under the same auspices, by an eminent architect of Philadelphia, on the subject of, "The Architectural Adornment of Cities," was also a factor in local architectural education. The keen interest shown in this lecture by our non-professional townspeople was another gratifying proof of the progress of public opinion in these matters.

Looking at the question from a different aspect, the higher standard of architectural taste can be unmistakably seen in the more general recognition of architects as professional men. The progress of legislation with respect to the practice of architecture might be mentioned as one phase of this recognition. The public are rapidly coming to appreciate the necessity for scientific and scholastic acquirements on the part of those who have in their hands the construction of buildings. The restriction of architectural practice to those who have demonstrated their fitness for such responsibility is becoming more general.

Nowhere is this to be seen more than in the neighboring republic, where architectural progress has undoubtedly been more marked and rapid than in any other country in modern times. Some three or four years ago the state of Illinois passed laws for the registration of architects duly qualified. These laws having worked well, several other states have followed the example of Illinois and it is doubtless only a matter of a short time before this action will become general. Even in conservative England, sure, if slow, progress is making in the same direction.

On an occasion like this it is not out of place to take a brief survey of some of the more important examples of recent architectural work. On this side of the Atlantic the buildings of the Pan-American Exposition at Buffalo must first be mentioned. So much, however, has been said and written about these beautiful buildings that it is unnecessary to comment further on their general architectural style. There were those who, in the early stages of the buildings, prophesied that the Exposition would mark an epoch in American architecture, particularly in the external application of color to buildings. In this respect, however, it is now generally conceded that the result was disappointing, not in the application of color but in the lack of it. The brilliant, rich coloring we were led to expect was wanting, the general impression of color being that of quiet neutrality. A few of the domes were conspicuously painted and other parts of some of the buildings were strongly colored, but these were not numerous enough to seriously affect the general architectural scheme.

In England a spirit of electicism seems more prevalent, each architect choosing for himself that style or line towards which he feels most drawn, and along which he pursues his course alone. There are, at the present time, in Great Britain, many architects of high culture and great ability, whose work, chiefly domestic, is delightfully charming. The published illustrations of some of the more important houses, recently erected, show work full of character, inclining to plainness and simplicity of treatment, yet in many respects more satisfactory and pleasing than the immense, magnificent palaces which are building in such numbers in America.

English Architecture fails to show, as yet, any common movement in a specific direction, and it is difficult, not to say impossible, to predict even its near future. The recent discussion as to the style of Architecture to be adopted for the proposed new Liverpool cathedral serves but to confirm this view.

Glancing at recent work in the United States, in general, the influence of the French school is strongly marked, and must have the effect of retarding the growth of a national spirit in American Architecture. At the same time excellent work is being done, better work than any which has preceded it, and the future certainly looks most promising. American architects, if indeed imbued with the spirit of a foreign school, are for the most part working unitedly along the same line, and if the history

of Architecture teaches anything it certainly teaches that its greatest monuments have been the culmination of a long period of earnest, enthusiastic effort on the part of many who labored with a singleness of purpose along one common line.

In our own country Architecture is influenced more by that of our neighbors on the south than by that of the mother land. The climate, the building materials and our general mode of life are all conditions much the same as those obtaining in the northern and eastern states and our architecture naturally resembles their's more closely than that of any other country. Criticism of our work to be of value had better come from an outside, unprejudiced source, and I therefore leave it in other hands. That there is a future of much promise there can be little doubt. The part that our Association shall take in that future depends on its individual members. In the past the Association has certainly accomplished something for the profession of architecture. Judging from the work done during the past year in the line of education alone, it will accomplish more in the future. It has had to bear the brunt of much severe if not unfriendly criticism, criticism the harshest from, in some cases, those who have most fully enjoyed its benefits. Mistakes have doubtless been made, but we believe firmly there is an earnest desire on the part of those who have stood by the ship through many storms, and of those who take the deepest interest in its affairs to profit by such mistakes and to make it a power in Ontario for the advancement of Architecture of which all its members may well be proud. Let every architect throughout the province rally to its support, and such a result will not only be sure but speedy.

Mr Langton read the treasurer's report :

TREASURER'S STATEMENT, JANUARY, 1902.

RECEIPTS.

7 Registration fees	$105.00	
1 Payment on account of registration	5 00	
Members' annual fees, class I	80.00	
" " " " III	33.00	
" " " " V	16.00	
" " " " VI	12.00	
" " " " VII	16.00	
Cheque from Engineers' Club to adjust the balance of common expenses	219.00	
On account of rent of room to chartered accountants	5.00	
Fees for watercolor class	24.00	
Examination papers sold	50	
Interest on bank balance, 1901	29.20	$ 327.89
Bank balance from 1900		1,029.11
		$1,357.00

EXPENDITURE

W. R. Gregg, Registrar	$100.00	
Registrar's petty cash	30.00	
Furnishing rooms	118.30	
Rent	150.00	
Picture framing	21.06	
Convention expenses	40.75	
Design for diploma	12.00	
Engrossing and mailing diplomas	15.00	
Engrossing minutes	10.25	
Publication of Proceedings	22.90	
Stationery	8.75	
Printing	25.34	
Journals	10.00	
Books for the library	10 00	
Gas	2.23	
Insurance	6.43	
Refund of readmission fee overcharged	10.00	
Share of street decorations for reception of Duke of Cornwall and York	7.20	
C. M. Manly Instructor of watercolor class	24.00	$624.21
Balance in hand		732.79
		$1,357.00

In the list of expenditures appear items for furniture, $118.30; pictures, $21.06; books, $10; in all $149.36. It is proper to state this separately as an account of assets acquired during the year, and, from this point of view, to withdraw the amount from the statement of current expenses, thus reducing that total to $472.85. Examining in the same way the treasurer's statement of last year we find a total expenditure of $358, composed of assets acquired in furniture, amounting to $131.89 and a remainder of $226.11, which represents current expenses. It appears, therefore, that our expenses during last year were $246.74 more than the year before. Of this, $150 is rent, an expense incurred for the first time last year. The remainder, $96.74, must be accounted for as the increased cost of living in our new quarters, with an effort to make the Association more useful than before we established ourselves in quarters. Certain items, viz., the cost of issuing a diploma, $27; gas, $2,23; insurance, $6.43; contribution to street decorations, $7.20; journals for our Club room, $10; in all $52.86, are a direct consequence of the institution of these rooms and, as regards the diploma, of our having taken a more decided position in the world. The convention of 1900 cost $3; the last convention, the expense of which is in the present statement, cost $40 75. These items alone amount to $93.61, which is about the difference in expenditure between the two years.

The receipts for fees in the statement of last year were $332.00. This sum included fees paid in between Dec. 30, 1900, when the Treasurer's books closed, and Jan. 29, 1901, the date of the convention. Estimating in the same manner we find that adding $65.00, the amount of fees received by the Registrar since Dec. 30, to the sum of $267.00 which appears in the statement of fees received in 1901, the total receipts in fees from the convention of 1901, to the present, are the same as from the convention of 1900 to that of 1901.

Mr. Burke : In moving the adoption of the report, said: Of course it will be apparent to all the members that our bank account has been seriously depleted by the expenses incurred by the occupation of these rooms, and I think it will be necessary soon to take steps towards increasing the fees or to adopt some means of increasing our income, or we shall not be able to meet expenses.

Mr. Pearson : I think Mr. Burke is right. The difficulty is one that will have to be met sooner or later. We have made an inroad on our capital. This is largely due to the furnishing of the rooms, which we must consider more or less an asset. But there are expenses incurred which cannot be considered in this way and the sooner we face the question of increasing fees the better, as there is no other way by which we can increase our income. What were the expenses before the Association got into the rooms, and what expense are they going to add?

Mr. Langton stated that the expenses in 1900 were $358.00 and the income from fees $332.00. That the rooms having been fairly started, the expenditure should not be quite as high as this in the future, but an expenditure of about $484.00 might be expected.

Mr. Denison : Has the membership fallen off?

Mr. W. R. Gregg : (The Registrar.) The membership is the same. I think the Treasurer's report in the future should include valuation of furniture, library, etc.

Mr. Pearson : Outside of these assets our expenses are increased. Can we not raise the fees?

Mr. Gemmell : Have we got to the point of facing this question yet?

Mr. Pearson : The figures on the board demonstrated that the time for facing this question had arrived.

Mr. Helliwell : I think there is not the slightest doubt but that we are running behind in capital. I think it is the wisest course to face the question now before we get into a critical position. Shall we increase the membership or the fees?

A Member : Both.

Mr. Gibson : There are a large number of architects in Toronto who are not members of the Association. I think that some of these should be members of the Association, and that there must be some reason why they are not.

Mr. Helliwell : The question I think with most architects is, "shall I get what I pay for." If we can make this Association of tangible value to the architects of Toronto they will come in, and pay their fees.

Mr. Denison : Mr. Chairman, it occurs to me that we never have made an actual effort to bring the architects into this Association. We send them printed matter (It is a pretty cold blooded way to invite an architect into the Association). I think a committee should be appointed to meet every individual architect and put the matter before him in a way to induce him to come into the Association. I believe there are architects in Toronto who are desirable men to have in the Association, and that they could be brought into it. It seems to me that architects are a very peculiar people. In olden days one architect would scarcely let another into his office. I am glad to say, since the formation of this Association, architects are not so exclusive, inside the Association, and I think this good-fellowship might be extended outside the Association. Often members let their fees get behind through indifference. If we could only make these members wake up to the fact that to have the world think well of us it is necessary for us to think well of ourselves! If the concern is an active concern members feel that they are getting value for their money; if it is inactive and members are indifferent, everybody treats it in the same way. Continuing Mr. Denison urged that efforts be made in a sincere and active manner to bring new members into the Association, and stated that if it would meet with the approval of the meeting he would like to move that a committee be appointed with this object in view.

Mr. Helliwell : The qualifying examinations which are required by our Act of Incorporation, may be a difficulty in the way of some persons becoming members.

Mr. Wickson pointed out that the Association had made an effort to get in new members at one time, and that a certain number were brought in; also that another effort had been made last year to get in some young men, which was unsuccessful.

Mr. W. R. Gregg : Mr. President, I would second Mr. Denison's motion. It covers a great many men throughout the Province, outside those Mr. Wickson speaks of. There are a great many men outside of the Association who should come into it, and I think a committee should be appointed by the Council to get them into the Association. There are probably 30 or 40 architects practising in the Province who should be members. I have much pleasure in seconding Mr. Denison's motion.

Mr. Helliwell : Mr. Denison's motion is that a committee be appointed to devise means to increase the membership.

Mr. Langton suggested that a committee be appointed composed of Mr. Denison, Mr. Burke, Mr. Pearson and the Registrar, to think over what proceedings they would suggest, to report to the Convention to-morrow, and that then if their report was adopted, the committee should be appointed as a permanent committee, to carry out the proposals of their report.

Mr. W. R. Gregg stated that he had embodied Mr. Langton's motion in Mr. Denison's motion, viz.,—Moved by Mr. Denison, seconded by Mr. Langton that a committee be appointed consisting of Mr. Denison, Mr. Burke, Mr. Pearson and the Registrar to devise means to increase the membership, and to report on Wednesday.

Mr. W. R. Gregg then read the Registrar's report.

REGISTRAR'S REPORT.

COUNCIL MEETINGS—The Council has met eight times since the last annual meeting, and the average attendance has been 5½.

NEW MEMBER OF COUNCIL—Mr. Geo. W. Gouinlock was elected a member by the Council early in the year to fill the vacancy caused by the resignation of Mr. Eden Smith.

MEMBERSHIP—The present membership of the Association is, Honorary members, 3; Resident members, 37; Non-resident members, 26; Total, 66 members.

STUDENTS—The new Pass Course Curriculum for students was issued in April, and copies were sent to all members of the Association.

The Honor Course Curriculum has been printed this month, and is now being sent to members.

Probably on account of the fact that changes were being made in the courses of study, no students presented themselves for examination last March.

Members are reminded that students must serve under indenture such time as is required in the by-laws, and that forms of Articles prepared by the Association, may be obtained from the Registrar, and that a copy of these Articles is required in each case to be sent to the Registrar and filed by him. Also that students are required to give the Registrar one month's notice of presenting themselves for examination.

The by-laws provide that examination shall be held in March of each year.

MONTHLY MEETINGS—On Tuesday evening, January 29th, on the occasion of the last Annual Convention, members of the Association and a number of invited guests assembled to hear a lecture by Mr. G. A. Reid, R. C. A., upon "The Summer Cottage," illustrated by lantern slides, and a description of the Paris Exposition, by Mr. F. S. Baker, F.R.I.B.A., also illustrated by slides.

Monthly meetings were held on the evenings of Feb. 12th, March 12th and April 9th.

Post cards announcing these meetings were sent to each member of the Association. The average attendance was 12.

At these meetings the following matters were considered:—The improvement of the water front of Toronto, the grouping of the Toronto Exposition Buildings, the improvement and better equipment of the School of Practical Science, and the importance of the Government's obtaining the best possible design for the proposed School of Science Building in connection with Toronto University. In connection with these matters correspondence was carried on or interviews were obtained with the Mayor of Toronto, the Exhibition Board, and the members of the Ontario Government, respectively, and the views of the Association were fully expressed and were received, and considered.

The Monthly Meetings Committee takes in hand the securing of papers to be read and other arrangements for the annual meeting, which occurs upon the date set down for January Monthly Meeting.

PROCEEDINGS—The first annual volume of Proceedings of the Association was prepared in February, and four hundred copies were printed. Copies were sent to members and to a number of Canadian, American and English Architects, and others interested in architecture: also to Canadian, British and Foreign Clubs and Societies.

A number of interesting exchanges have been received in return, and these are kept on file in the Library for the use of members, where they may now be seen.

STUDENTS' MEETINGS—The use of the hall on Saturday evenings was granted in April by the Council to the Toronto Architectural Students' Club for meetings of an educational character, and a few of these meetings were held last winter, but the Club has as yet taken no advantage of this privilege during the present winter.

COMMITTEES AND CHAPTER—Important work of the Association has been carried on during the year by the following committees, which have reported progress from time to time to the Council, and have now reports to be presented to this meeting of the Association : Rooms Committee, Mr. John Gemmell, Chairman ; Patrons of Studio Work, Mr. Frank Darling, Chairman ; Educational Committee, Mr. A. Frank Wickson, Chairman ; Revision of By-law Committee, Mr. W. R. Gregg, chairman. The Toronto Chapter, of which Mr. E. Burke is President and Mr. H. E. Moore is Secretary, will also present a report.

The report was adopted.

Mr. Gemmell read the report of the Rooms Committee.

REPORT OF ROOMS COMMITTEE.

Your committee formed to look after the furnishing of these rooms have thought that the evidence of their faithfulness to duty or the reverse is in the nature of things so tangible that a report was hardly required of them. But our Registrar thinks otherwise and has now at the beginning of the third year of our occupation, insisted on a formal report being laid before you.

This we will endeavour to do with the preface that being from private notes, it must not be allowed in its financial aspect to conflict with accounts of the Association duly chequed and paid, but is sufficiently correct to give you the value of the personal property of the Association.

The first item although a most necessary one has cost us nothing —your committee noticing changes in plans as carried out from sketch accepted by Association, by correspondence and interview, persuaded Mr. Horn to install the library cases in lieu of separate entrance and vaults shown on that sketch, and he also stained and varnished floors. Your committee then started house-keeping, Mr. Townsend and myself made repeated visits to the great stores, the only result of which was securing the Japanese rug, an easy chair and curtains for windows and arriving at the conclusion that the stock furniture within our means would give the rooms a hopelessly commonplace effect. We therefore got Mr. Rawlinson to make from sketches, the black oak table and arm chairs in our sitting room which we trust have a more distinctive character.

The fine photo of "Michael Angelo's Moses," was bought at a timely auction sale. The reading desk is a capital given us by Mr Colbrook, to which we added the desk and shaft.

The dog irons were put in by Rice Lewis & Son. The plaster statuary was a donation from W. J. Hynes except the Diana given to us by Mr. Baker as New York's idea of that chaste goddess.

The photograph of the bronze gates of Baptistry at Pisa is a gift from Mr. Langton.

The rooms we would report have been a great convenience for the meetings of Council and committees, and from their central position give us a standing in the community by which we can further the interests we have at heart.

The Toronto Guild of Civic Art asked and were allowed to hold their annual meetings in lecture room, your committee judging their aims are kindred with our own.

Mr Langton and Mr. Darling have given much time and study to students' classes in design, two evenings in the week.

A class in water colour painting has been taught by C. M. Manly on Saturday afternoons and has been appreciated by some members of the Association and students.

We would also report some revenue derived from other societies for hse of rooms on dates not required by either engineers or architects. The Society of Junior Accountants are allowed to hold evening meetings two Mondays in the months of December, January, February and March for which they are to pay $20. $10 was received from Ontario Land Surveyors who held their annual meeting here.

In closing our report we would ask that members be urged individually to make use of the rooms on all possible occasions. If books and periodicals are of value in the pursuit and study of architecture, we have by the kindness of the Public Library and individuals had some of the very best on our table and it is the intention to ask for increase of our periodical fund.

A weekly noon day lunch has been set out every Tuesday by our steward with increasing success and for these we would bespeak a larger patronage—regarding the discussions around the board and after as being valuable in promoting good fellowship among our members, and acquiring a room-frequenting habit, and these meetings have

many times been a means of keeping pace with public affairs that affect architectural progress.

Your obedient servants,

S. H. TOWNSEND
J. A. PEARSON
JOHN GEMMELL
} Committee.

STATEMENT OF PERSONALTY, O. A. A.

½	Assembly room chairs	$ 16 50
	Morris chair	7 55
	Electric fixtures	30 00
	Large table	12 00
	Fixed seat	10 00
	Japanese Rug	15 00
	Black oak arm chairs	32 00
	Window blinds	4 75
	Curtains	12 00
½	Reading Stand	2 50
½	Hall Table	5 00
¼	Cuspidors	1 00
½	Lantern Curtain	5 00
	Velour Cushion for Seat	9 50
	Michael Angelo's Moses	1 80
	Regilding Frame "	2 00
½	Large table	1 25
½	Hall oak chairs	12 50
12	Picture frames	10 00
	Glass for same	1 06
	Cardboard mats	2 40
	Mounting and framing lantern photo	5 60
		$199 41
	Goldie & McCulloch safe	30 00
	Table linen, cutlery and delf	25 00
		$254 41

The report was adopted.

Mr. Denison: Mr. Chairman, I don't see why the City Council should not be waited upon by this Association and asked for help. They make grants to other Associations of like character, and I do not see why they should not make us a grant. They help all kinds of educational institutions, Art schools, etc., and I don't see why they should not help our educational efforts.

Mr. Helliwell: The committee will no doubt take this into consideration.

The report of the Committee on Studio Work was adopted as follows.

REPORT OF THE STUDIO COMMITTEE.

The studio committee consisted of Messrs. Darling, Gemmell, Symons, Langton, Over and Moore. Last winter the studio worked two nights a week for three months. Messrs. Darling, Langton and Over took one night and Messrs. Gemmell, Symons and Moore the other. We gave themes for design presented to the students in various ways and criticised their work with a view to giving them an idea of the fundamental principles of composition. We came to the conclusion that the students are not sufficiently instructed to make this exercise profitable and are devoting ourselves this year to systematic study of the principles of design as exemplified in the historical styles. We are holding classes on only one night in the week as being more convenient for both students and instructors and are proposing to continue them through the whole winter season. Up to the present, Mr. Langton and Mr. Over have been teaching the principles of the composition of the Roman Orders. These lectures are nearly completed and will be followed by instruction by Mr. Symons and Mr. Over in the principles of gothic and of the renaissance by Mr. Gemmell and Mr. Over.

(Signed) FRANK DARLING, Convenor.

Mr. Wickson then read the report of the Education Committee, the adoption of which was moved and carried.

REPORT OF EDUCATIONAL COMMITTEE.

Your committee on Education beg to report that they have arranged two courses of study called respectively "Honor Course" and "Pass Course," each having a curriculum of study and examinations.

The Pass Course has mainly been adopted to suit the requirements of those who are absolutely unable to attend the School of Science, but on the curriculum it is emphatically stated that students are strongly recommended to take the Honor Course.

It is also intended to cover the case of a number, who having already started on their studentship could not well abandon their present position and begin again.

In this course the student is required to serve not less than five years with a principal.

The subjects to be studied and in which examinations will be held, are: Knowledge of Building Trades, Mathematics, History of Architecture, Statics, Strength of Materials, Structural Iron Work, Mouldings, Features and Ornaments, Design, Architectural Jurisprudence, Heating and Ventilation, Sanitary Science, Steel and Iron Construction, and Protection in Buildings.

Students living in any section where studio classes are being conducted are required to attend and graduate from such classes, but all others are required to pass examinations in Design in the final year.

The students are advised to take the Mathematics in Technical Schools where such schools are already, or in the future may be established, the balance of the work having to be taken up individually, but from a complete list of the most carefully selected text-books.

HONOR COURSE.—The Honor Course calls for a higher educational standing on the part of the student before entering.

These students are also required to serve five years with a principal, though graduates from the Ontario School of Practical Science will require to serve three years only, one of which may be served during vacations.

To conform to the opinion held by many architects that a course of scientific training is more beneficial when taken concurrently with office practice, the Honor Course has been arranged to permit the student to take his office and University training at the same time and includes three branches.

"A" Science.
"B" Business.
"C" Design.

The subjects in branch "A" are taught at the S. P. S., the student being required to attend the school about seven hours a week during the school session, and in connection with this a timetable quite feasible in its working has been drawn up showing the hours at which attendance would be required during the five years.

Branch "C" (viz. Design) would be taken up in the Studio work (a separate report of which will be presented) and while no stated examination is held a progression by mentions is necessary for passing in it.

Copies of the Curricula as attached to this report may be obtained from the Registrar.

Your committee feel the members of the Association cannot be too urgently requested to refuse to take pupils except under the conditions that they agree to take in its entirety one of these courses, and if in Toronto it shall be the Honor Course, any other method of service being manifestly unfair to an applicant even if he, in his ignorance of the consequences, be willing to accept a studentship under other terms, and on the other hand equally unfair and damaging to the entire profession.

In addition to the Studio work this season, there has been a water color class conducted by Mr. C. M. Manly, A.R.C.A., which is being attended by some eight members.

A. FRANK WICKSON,
Chairman.

Mr. W. R. Gregg was then called on for the report of the Committee on the Revision of By-Laws. He pointed out several changes in the By-Laws such as the requirement of 5 years practice to qualify for membership of the Council instead of 10 years as formerly; the addition of a Chapter By-law. He said that it was understood that the monthly meetings were not supposed to take powers on themselves that would not be fair to members outside the city who could not attend, but that every member should attend the annual meeting. He referred to the change made in that certain classes of members who formerly paid only $2 a year pay $3 now; so that there are now only two classes of members. Another change relating to fees is, that students coming up for the final examination are expected to pay only one fee covering examination and admission to membership of the Association.

Mr. Burke moved that the balance of business be postponed till after Professor Capper had delivered his address.

Mr. Helliwell: Gentlemen, in introducing to you this afternoon Professor S. H. Capper, of McGill University, Montreal, I bring before you the name of a gentleman well known to you all. The architects of Ontario have for a long time wished to listen to a lecture from Professor Capper, and I can assure him that he will be listened to with the very greatest possible pleasure.

Professor Capper then read his address which was received with hearty applause. (See page 13).

Mr. Helliwell: In presenting a vote of thanks to Professor Capper said he would like to express his personal appreciation of the paper.

Mr. Capper expressed his thanks to the Association and the Chairman for the expression of their appreciation of his address, and regretted that he would not be able to stay over the following day.

The business of the convention was then resumed.

Mr. W. R. Gregg, Chairman of Committee for the Revision of By-laws said that the adoption of the report as far as the convention was concerned was the adoption of clauses 13 and 14. He moved that the by-laws as they had been revised he adopted, seconded by Mr. Moore and carried.

Mr. Moore then read the report of the Toronto Chapter.

REPORT OF THE TORONTO CHAPTER.

The Chapter has at present on the roll of membership 37 resident members.

In submitting this report to the Association it is perhaps necessary to explain that early in the year the Chapter instituted weekly luncheons which have been continued throughout the year with great success. This luncheon is held every Tuesday in the Association rooms and has proved of great benefit, both from a social and professional standpoint, as it has accomplished the desired effect of bringing the members continually into touch with one another.

Discussions have been engaged in on matters of interest to the profession generally. Public questions have been taken up and discussed, with the result that the Chapter has acted directly and indirectly in connection with other organizations on all matters where the public interest is concerned.

Some of the most important subjects taken up by the Chapter during the year are given below.

RE THE ERECTION OF NEW GOVERNMENT BUILDINGS.—After discussion a deputation consisting of Messrs. Helliwell and Langton, was appointed to interview the Government re giving the work to private architects. Mr. Helliwell reported the interview with Messrs. Latchford and Harcourt, and stated there was a strong inclination to employ the Government architect, and that Messrs. Heakes, Wright and Galbraith would be the delegation to visit other cities in the United States for information. It was possible, that a competition would be restricted to Canadian architects, but the work was finally placed in the hands of the Government architect; the Government offering to let the Association look over the plans.

GENERAL IMPROVEMENT OF CITY RE LAYING OUT OF SQUARES, DRIVES, ETC.—The delegation from the Association, Messrs. Burke and Gregg, which attended the meeting of the Guild of Civic Art, reported that a large committee had been appointed to wait on the City Council, urging on them the desirability of employing some competent person to prepare plans for the general improvement of the city. Mr. Langton gave a synopsis of the work of the Guild of Civic Art.

BUILDING BY-LAWS.—Mr. Wickson was appointed to take Mr. Gordon's place on the City By-Law Committee, the latter having to resign, on account of his trip to Corea.

A letter was written to the city urging a conference with the O. A.A., before finally adopting new building by-laws.

TECHNICAL SCHOOL.—A letter was sent to the Technical School board, suggesting that a properly qualified principal be appointed, with special reference to industrial design.

EXHIBITION IMPROVEMENT.—This matter was taken up and discussed by the Chapter, and is fully dealt with in the Association report.

Other matters discussed at the various meetings are as follows: Harbour Square Improvements, Decoration of City for Duke of York's Visit, Dominion Museum. It was announced that Mr. Tarte was in favor of putting the plans for proposed new building out to competition. "Building Permits—What is the Practice of the Architect with regard to giving the Cost of a Building when taking out a Permit?" "The Designation of the Different Floors of Buildings;" after discussion this matter was left for decision at the next convention. "The Yearly depreciation in Value of Buildings."

At the last two meetings, business in connection with the coming convention was discussed.

A very successful innovation at the weekly luncheons, was the exhibition of architectural works and books loaned from different sources for the purpose of inspection by the members.

The average attendance during the year has been, total 407, and it is to be hoped that during the coming year, every member will take advantage of these luncheons, and increase the interest by his attendance.

Mr. Burke: One item of this report was never carried out—the promise of the Minister of Public Works. He promised that we should have the opportunity of criticising the plan of the new building for the School of Practical Science before it was carried out by the Department. We have never had the opportunity of criticising the plans.

Mr. Moore explained that he thought the plans were not far enough advanced yet to criticise them.

Mr. Gemmell: I think this is a privilege the Association should avail themselves of. I think it worth while to remind the Minister of Public Works of this promise.

Mr. A. H. Gregg then read the report of the Library Committee.

REPORT OF THE LIBRARY COMMITTEE.

The library has been well used during the past year, the number of lendings showing a considerable increase over those of 1900.

The Association has subscribed to the regular editions of the Architectural Review, London, the Studio, London, and THE CANADIAN ARCHITECT AND BUILDER, and the current numbers of these periodicals are kept in the rooms for the use of members.

In addition to these magazines the Association receives in exchange for its annual proceedings various weekly, monthly and yearly publications of architectural and engineering societies in Great Britain, France, Italy and United States.

The following new books have been added to the library:—Brigg's "Modern American School Buildings," Carpenter's "Heating and Ventilation of Buildings," Robinson's "Principles of Architectural Composition," and Freitag's "Architectural Engineering."

Members outside the city are reminded that the books of the library will be sent by mail, the postage for delivering the books being paid by the Association. Magazines will also be sent in the same way.

A catalogue of the library is to be found in the Annual Proceedings.

Mr. Gemmell referred to an appropriation which was proposed for getting periodicals.

Mr. Helliwell thought this had better be left to the Committee of Finances.

Mr. Aylsworth read the report of the committee for publishing the proceedings.

REPORT OF PUBLISHING COMMITTEE.

Your committee being still of the opinion that the annual publication of the Proceedings is desirable and in the interests of the Association, recommend that it be continued.

With this probability in view a form and style was adopted that should require no change from year to year except in illustrations and number of pages.

Its distribution in the proper channels by the Registrar has been the means of attracting in return a large number of similar reports from sister associations and other valuable publications always welcomed by the members who avail themselves of the use of the reading room.

The cost of paper and printing was unwittingly borne by Mr. C. H. Mortimer, of THE CANADIAN ARCHITECT AND BUILDER, in accordance with his offer made before learning that the number of copies would be insufficient for an advertising medium, and that so large a proportion of the work had to be set up specially.

As considerable of the matter may be used as set up for THE CANADIAN ARCHITECT AND BUILDER after each convention, thus reducing the cost, and feeling under obligation to Mr. Mortimer, we recommend that for producing Vol. No. 2 his offer at $50 be accepted.

To partly meet this it is hoped that at least one appropriate advertisement may be secured.

With Vol. No. 1 before the convention the committee invite criticism and suggestions for improvement.

Arrangements have been made for reporting this convention in the same manner as that of last year.

M. B. AYLSWORTH,
Chairman.

Mr. Burke: Before that report is adopted it would be well for the Association to notice that it involves the expenditure of $50.00 for the publication. I have had word from Mr. Mortimer, and he states that it is impossible for him to cut that expenditure down, that he cannot get advertisements to renumerate himself, and it cannot possibly be done for less than $50.00.

Mr. Langton said he thought the report could be adopted recommending the publication of Proceedings without adopting the means.

Mr. Aylsworth said that in adopting the report the expenditure of $50.00 would certainly be approved.

Mr. Denison suggested that the report be adopted with the revisal that the Proceedings be published if the Council saw their way to do it.

Mr. Kay was of the opinion that the expense could be met by advertisements in the Proceedings.

Mr. Helliwell pointed out that on account of the smallness of the circulation it was hard to get advertisements.

Mr. Gemmell stated that 400 was the edition, and he thought that a very good circulation.

Mr. W. R. Gregg stated that about 300 had been sent out.

Mr. Gemmell was of the opinion that the Proceedings should be published. He thought it unwise to publish them one year and drop them the next year. He considered that the idea of advertisements was made too little of, that two or three advertisements would meet the whole expense.

Mr. Wright said he thought it most desirable that this year at all events the publication be continued. He considered the money was well spent. While the circulation was very limited, it reached a very desirable class, and he could not see why there should not be in the Proceedings, advertisements of building material, as it reached the very class the manufacturer wished to reach and in the best form. He did not see why there should not be advertisements that would easily cover the expense of $50.00, and he thought it would be a great mistake if the publication was not pushed for another year even at a loss of $50.00.

Mr. Aylsworth said he saw no reason why the report should not be accepted.

Mr. Gemmell thought the motion that should be added to the report was the privilege of allowing advertisements on the cover of the Proceedings.

Mr. Helliwell said that was acceded to, and the report was finally carried.

Business was then adjourned till Wednesday.

SECOND DAY.

Business was resumed on Wednesday, 15th, at 11.55 a. m.

Mr. Denison read the report of the Special Committee appointed on Tuesday:

REPORT OF COMMITTEE ON INCREASING THE MEMBERSHIP.

Your committee recommend that the Council appoint an active committee to see the city members who have allowed their membership to lapse through nonpayment of dues, and architects who have qualified for membership, but who have not yet identified themselves with the Association, to explain to them the advantages and present object of the Association and to request them to renew their membership or enter membership, as the case may be, in accordance with the terms of the by-laws.

Also that a committee of the same purport be sent to out of town members who have permitted their membership to lapse.

Your committee do not see any other practical method of reducing the annual deficit, other than raising the annual dues, or making a special assessment.

Your committee think that each member of the Association could do valuable missionary work in endeavoring to enlarge the membership, and that a sense of individual responsibility regarding the progress and welfare of the Association should be pressed upon every member.

Your committee also recommend that the committee be requested to ask the City Council to make a grant towards the support of the educational work of the Association.

Mr. Pearson: With regard to this question of inducing the other architects in the city to join the Association, I think that we should each one of us make an earnest effort in this direction. It is no good sitting still and listening to this recommendation that the committee should go out and see certain men, but I think that each one of us should make an effort in this way, as we would have a great deal more influence with certain of these than the committee. Each one of us before we leave this room should think of someone he can go and get to join this Association. The outside men should be made aware of the good work that is being done in the Association, of the good papers that are being read at our meetings, of the studio work, etc.

Mr. Kay: Mr. Chairman, if Mr. Denison has moved the adoption of his own report, I would second it. I never see very much good come out of this forming ourselves into a committee of resoluters. It is the individual effort that counts and much more will come out of it. As my friend Mr. Pearson suggests, I think if we would all go out and make an effort much more would be accomplished.

Mr. Denison: I move the adoption of the report. I believe in this missionary work. There is no reason why the members in past years should not have been making this effort, but this is a step in that direction, and I certainly will do my part in connection with it. We have gone through a very difficult stage in our life's history. The Association and Eighteen Club have got apart, but I believe that this thing will come right yet, that we will come together again. There is really good feeling between the Eighteen Club and the Association, but there is some peculiar little feeling between us which I think will die out. I think if we were to unite together we could do wonders in the interests of the young members and of the students, but so long as we are divided, so long as there are two parties, we are divided one against another. If we were together our students would not be divided. It is a common thing for our students to come to us and say, "Where ought I to go: to the Eighteen Club or to the Association?" There is nothing in the way of the Eighteen Club carrying on their own Club, but we should be together; we should be on one plane.

Mr. W. R. Gregg, as a member of the committee, supported the report, and said that he wished to amend his report of yesterday before it was printed. He wished to say that there were 67 members. The Association was not falling behind; it was at least keeping up.

Mr. Gibson: Mr. Chairman, at one time every architect in the province was a member of the Association, now there are not much more than one-third members. There must be some reason why these men dropped out. I think there ought to be some effort to find out the reason of this.

Mr. W. R. Gregg pointed out that the best way to find this out was to go and see these men personally as suggested in the report, as they would be sure to state what they had against the Association.

Mr. A. H. Gregg: Mr. Chairman, Mr. Denison has referred to methods by which the membership might be increased in Toronto, and of missionary work that might be done here. Outside of the city there is also much missionary work that might be done. Mr. Gibson has referred to the reasons why architects have not joined, or have allowed their membership to lapse. I think the reason is often indifference, or is found in the remark, "what good is the Association doing anyway?" Now take "What is the Association doing?" This year the Association has performed a tremendous amount of work in preparing two curriculums of study, the pass course and the honor course, and these two sheets are worth the membership fee to any member. The pass course is arranged so that any student throughout the province who wishes to take up a thorough course of Architecture is enabled to do so by home study. The Association suggests the proper books to read, and is prepared to examine the students. For more ambitious students who wish to take a special course at the School of Science we have the honor course, by which the students can take a course at the School of Science and then go back to their offices to complete their studies, or if Toronto students, they can, by a special arrangement with the government, attend the School of Science and at the same time put in their time in an office. Provision is made throughout the province for a student to take a course that is of advantage to him, and just that one item is worth far more than the fees themselves to every architect who is up-to-date, I should say. And there are other advantages, such as recognition in the law courts, which can be brought before lapsed members, and if it is through indifference that they have allowed their membership to lapse I do not see why they should not be brought back into the fold.

Mr. Helliwell: Along the lines of Mr. A. H. Gregg's remarks, I would like to say that not very long ago I had occasion to advertise for a student, and I was very much surprised to find a large number of young men all over the country who were taking up the course of the Scranton School of Correspondence. But anyone who has looked into the matter will see that the course we have arranged is a considerably better course than can possibly be afforded by this Scranton school, but they do not know it. If there could be any way by which they could know this, and that this course could be carried on at their homes, I think it would in the long run be of great benefit to the Association. We cannot expect to have such influence with the older men to bring them into the Association, but in the younger men is where our help lies. In the meantime I think we may present this report, it is moved by Mr. Denison, seconded by Mr. Kay.

The report was carried.

Dr. P. H. Bryce was then called on for a paper on "The Disposal of Sewage of Houses, Hotels and other Institutions in Towns and Country Places where there is no Sewage System." The paper which was illustrated by charts and figures on the board, was received with hearty applause, and will be printed in a subsequent issue.

Mr. Denison: I would like to ask Dr. Bryce the name of the maker of this valve.

Dr. Bryce: Mr. Quinn, the maker of this valve is here.

Mr. Quinn brought forward a valve of the regular size and in a very explicit manner explained the working of same. The name under which the patent was registered, was the "Quinn Automatic Flushing Valve" and it was manufactured by the James Robertson Co., the cost price being $20.00. He also stated that some of these valves were in use and he had heard of no complaint as yet.

Mr. Burke enquired if this method of sewage disposal included in any form the bacterial disposal of sewage.

Dr. Bryce stated that it included the disposal of the whole of it.

Mr. Burke asked the question if the apparatus described would do away with the grease that would go into it?

Dr. Bryce stated that he had used one in his suburban residence, and the grease was practically all carbonated and done away with.

Mr. Wickson enquired as to the danger of frost affecting the tank, but was assured that if the tank was banked with earth or some leaves thrown over it the frost did not seem to affect it.

Mr. Curry in moving a vote of thanks to Dr. Bryce, mentioned the difficulty of getting enough earth in Muskoka in which to dispose of sewage.

Mr. Wickson: I have much pleasure in seconding Alderman Curry's motion. This subject on which Dr. Bryce has spoken to us to-day is one of considerable interest to us, and we are indebted not only to him, but to this gentleman who has brought this valve down and shown it to us.

The vote of thanks was carried with much applause.

Dr. Bryce in replying to the vote of thanks referred to Mr. Curry's remark about the scarcity of soil in Muskoka. He pointed out that the tank could be build on the rock, and for the final disposal of the sewage an artificial bed of sand could be made to these outlet tanks.

AFTERNOON SESSION.

After lunch Professor C. H. C. Wright read a paper on "The Behavior of Steel under Stress" (see page 16) which was illustrated by charts, scientific apparatus, diagrams and samples, the latter being passed around among the audience for their inspection.

Mr. Helliwell: We have listened to the papers that have been presented, with the greatest pleasure and profit. We have had especial pleasure in listening to professor Capper who came as a visitor to speak to us from Montreal. But it is with peculiar pleasure that I speak of the pleasure we have before us of listening to the gentleman who has come from the neighboring Republic to speak to us. I will not take up time further, but will call upon Professor Laird, and can assure him that coming to Toronto as he does now for the first time he will receive a hearty British welcome. (Clapping.)

Prof. Laird, in taking the platform, stated that he felt not only that he had received a hearty British welcome, but dozens of them since he arrived in Toronto. He then read his address which was heartily received, and which will be printed in a subsequent issue.

Mr. Langton: Mr. Chairman, I may as well take it upon myself at once to move a vote of thanks to Professor Laird for this admirable paper. I hope that it will not close the discussion, but I cannot speak without first speaking of thanks. It is a very full paper, a very complete view of architecture, and one which I am sure we shall be glad to keep in our minutes and look at again when we want to get in our minds the right spirit for carrying out our work. The soundness of Professor Laird's point of view may, I think, be measured by the frequency with which the word "plan" occurs in the earlier part of his paper. In the present welter of styles we can hold to that as the one sure thing. Plan is the basis of excellence, of real excellence, in all styles. It is the touchstone by which to test the quality of our work and to test the permanent value of new ideas. Mr. Langton went on to say that Prof. Laird, in pointing out that the architect of the present day is an organizer and leader of specialists, seemed to indicate that he could not be an inventor in detail. As to the question of style, he had great sympathy with persons who deliberately adopt a style, but he thought the way of true progress depends on the fact that the architect is an artist who does work for somebody else, and the problem presented to him must be at the bottom of his design. As to the handling, one may take an illustration from literature to show that connection between theme and style is natural to a cultivated workman. In the biography of Macaulay, who was par excellence the literary man, at home in literature, we find examples of styles as suitable to their purpose as his historical style, but quite different from it. His drily instructive minutes from India to the home government, his gay letters to his sisters, and impromptu verses, are very different in manner, but all suitable to the occasion—all in fact endowed with style. An artist is essentially a man of his time. His times are reflected in his work. From this we may infer that an architect, so far from abhorring the peculiarities of current local Architecture, ought to find in the reasons for their peculiarity a key to characteristic in his own work. In other words, if a designer is true to his problem he is bound to have Architecture, and if he studies native usage he is bound to have something that can be called style.

Mr. Burke: I have much pleasure in seconding the resolution of thanks to Professor Laird. We had some words of comfort for ourselves in that paper when we were told that costliness was not essential to good style, that sincerity was the best essential of design. We have not the means of putting up costly buildings in Toronto, but we can study with sincerity those that we do put up.

Mr. W. R. Gregg: Mr. President, I wish to support this vote of thanks to Professor Laird, and I wish to say that we regret very much that Professor Laird was unable to be with us yesterday. We had a paper yesterday on "University Training in Architecture." Professor Laird comes from a university that was founded in 1740, Benj. Franklin being one of the founders. The latest addition to that university was the architectural college, and since the year 1890 Professor Laird has been the leading spirit in that college. Central Ontario in the matter of architectural education is just about at the point where he began his work, and I hope Professor Laird will favor us with some words on university education in architecture before he leaves.

The vote of thanks to Professor Laird was then carried by the meeting with much applause.

Professor Laird: Mr. Chairman, during the preparation of my paper I was seized with qualms in the fear that the result of such labors as I put on it would be nothing, and I am not sure now that the paper itself has any distinct virtue or any great value, and it seems to me that the thanks that has been showered on me has outweighed what my paper has deserved. The particular form of architectural education which lies nearest my heart, and nearest Prof. Wright's, has been referred to, and of course I am very glad to speak about that, and I want to speak to you as a colleague of Prof. Wright's, as understanding (while not having had retailed to me) his difficulties, because I know by my own what these must be. Prof. Laird went on to say that the Architectural College of Pennsylvania was one of the latest children of Pennsylvania University, the great distinction of this University of course being having had in its founding the spirit of Benjamin Franklin. He thought perhaps there might have been a similarity of conditions attending the organization of the Architectural School in Philadelphia as compared with that here. There had been no School of Architecture before—a course of architecture had been offered at the University which consisted, however, of scarcely more than the shreds of what might be called an architectural education. Means had not been provided, nor had the Professor of Architecture been given an opportunity of submitting a thorough course of architecture. He then went on to tell how the architects of Philadelphia had conceived the need of an Architectural School in that very great centre of business enterprise and architectural activity, and that the formation and progress of this school was due largely to their efforts. Prof. Laird pointed out that since the thorough establishment of the school the principle that had been

followed was that an architect requires to be a man of a good general education. An architect must be a man with a technical education, but at the same time a man with a liberal education, so that he can take his place among other educated men and give his art the place that it requires. The aim of the University had not been to make the young men merely good draughtsmen so that they could go out and make fine drawings, or to educate them only in any one branch, but had been to give them a thorough training in all the branches of architecture. In conclusion Prof. Laird said that here in the Dominion we probably had not as promising an opportunity for founding an architectural school, but we certainly had the opportunity of securing to our young men the essentials of a good training in architecture. It would require, of course, that Prof. Wright should be aided; he should not be expected, as no one man could possibly do it, to teach all branches of architecture. At Pennsylvania the plan of having the principal branches taught by specialists had been followed up. He also pointed out that the man who is carrying on an architectural school must have the support of all the architects.

ELECTION OF MEMBERS TO COUNCIL.

The names of Messrs. Alexander, Ottawa; Denison, Gemmell, Gray, Siddall, Symons, Wickson, Wright were written on the board, from which three members of Council were to be chosen.

Mr. Helliwell: Gentlemen, our business is to appoint three members of Council. The printed list of nominations you have received has been reduced in number by some of the gentlemen who have declined to stand for the election, and the names of those upon whom you have to vote are on the blackboard.

Mr. Wickson asked to have his name removed from the list.

Mr. W. R. Gregg protested against Mr. Wickson's name being taken off, stating that Mr. Wickson had had a year's rest, had proved himself a very efficient President when he was in, and that the Council needed his presence because he was interested in the work. Continuing he said, "I want to say a little for the unfortunate men, whose names come at the end of the alphabet, and I would like to ask the members to start at the end of the list and select their members." (Laughter). Mr. Wickson thanked Mr. Gregg for what he had said, but stated he did not feel able to fulfill the obligations required of a member of Council, and that was why he wished his name taken off.

Mr. Burke pointed out that one out-of-town member had retired, and wished this borne in mind when selecting new members.

Mr. W. R. Gregg drew attention to the fact that it was necessary to have six men in attendance to carry on the business, that some of the city men were almost sure to be absent, that Mr. Munro, of Hamilton, was on the Council already, and that it would be well to have enough men from the city so that the Council meetings might not be delayed by having to telephone around trying to hunt up enough members to make the required six.

Mr. Saunders and Mr. Kay were then appointed as scrutineers.

Mr. Wright: Mr. President and gentlemen, if I am in order, we have met with a great deal of pleasure during this convention, and I think that we should recognize the fact that it is due very largely to the efforts of our retiring Council, and to our President, Mr. Helliwell, that they have thrown a great deal of personal influence into the preparation for this Convention, and that this is the culmination of a faithful year's work. I think that our retiring Council and our President have certainly fulfilled all the requirements. I think they have, during the year, devoted very successfully a considerable amount of time as well as of energy in promoting and developing that feature of our work which is bound to lead to a successful issue, the educational influence, the educational policy of this Association. And personally I feel greatly indebted to the members of this Council for the personal assistance and inspiration I have received directly through their efforts in bringing to this Association Prof. Capper of McGill University, and Prof. Laird of Pennsylvania University.

It is therefore with a great deal of pleasure that I move that a hearty vote of thanks from this Association be tendered to President Helliwell and to the past year's Council. (Loud clapping.)

Mr. Denison seconded the vote of thanks, which was carried with applause.

Mr. Wickson: I move that a vote of thanks be tendered to the Registrar. As you all know the honorarium which he receives for his work is merely an honorarium for the time and labor that he has put into it.

Mr. Burke: I have great pleasure Mr. Chairman, in seconding that motion. Mr. Gregg has performed an enormous amount of work for the Association.

Mr. Helliwell: The hearty thanks of the Association are due and are hereby tendered to the Registrar. (Applause.)

Mr. Gregg in replying suggested that Mr. Helliwell in presenting the vote of thanks to him was getting out of making a speech himself.

Mr. Helliwell: As far as the efforts of the Council are concerned, I can say the committees have done their work. The committees deserve recognition of the work, and a great deal of work has been done this year. I would just like to say in retiring, that I cannot find words to express my appreciation of the honor which the Association has given me in placing me in this position, and I hope that the Association may go on and prosper more and more as time goes by.

The scrutineers having counted the ballots; Messrs. Wright, Symons, and Denison were found to have the majority of votes.

Messrs. Bishop and Gemmell were reappointed auditors, and the meeting closed.

ELECTION OF OFFICERS.

At a meeting of the Council, held at the close of the convention, the following officers and committees for 1902 were chosen:

President, W. A. Langton, Toronto; First Vice-President, John A. Pearson; Second Vice-President, Geo. W. Gouinlock; Treasurer, W. L. Symons; Registrar, Wm. R. Gregg.

Council—Lawrence Monro, A. H. Gregg, Edmund Burke, C. H. C. Wright and A. R. Denison.

Board of Examiners—Prof. Galbraith, Chairman; C. H. C. Wright, S. G. Curry, R. J. Edwards, W. R. Gregg, Grant Helliwell, Edmund Burke, J. Wilson Gray and S. H. Townsend.

Monthly Meetings Committee—E. Burke, Chairman; John A. Pearson, F. S. Baker and S. H. Townsend.

Rooms Committee—John Gemmell, Chairman; S. H. Townsend.

Library Committee—A. H. Gregg, Chairman; W. A. Langton.

Editing Committee—W. A. Langton, Chairman; F. S. Baker, M. B. Aylsworth, C. H. C. Wright.

Patrons of Studio Work—W. P. Over, Chairman; F. Darling, John Gemmell, W. A. Langton and W. L. Symons.

Educational Committee—Prof. C. H. C. Wright, Chairman; A. H. Gregg, W. L. Symons, S. H. Townsend, A. F. Wickson and A. R. Denison.

City Building Laws Committee—Geo. W. Gouinlock, Chairman; Edmund Burke, A. R. Denison, J. Wilson Gray and J. A. Pearson.

Legislative Committee—W. A. Langton, Chairman; J. A. Pearson, Geo. W. Gouinlock and C. J. Gibson.

R. I. B. A. Examiners—S. H. Townsend and W. A. Langton.

UNIVERSITY TRAINING IN ARCHITECTURE.*

By Prof. S. H. Capper, McGill University, Montreal.

There are various architectural topics that are the subject of perennial discussion, according as one's view leans, with natural bias, to one side or another in matters essentially many-sided.

"Whether architecture is a profession or an art?" is such a topic; upon it discussion—nay, controversy, both bitter and prolonged, has raged interminably; and, in England at any rate, even serious division of council has resulted, with somewhat dissipated energy and hampered action for a time as a natural consequence.

Closely allied is the question of the proper training for an architect during his period of preliminary studentship;—what course will best fit him to do his best? It is a question, I venture to think, of somewhat vital concern to us in Canada. At present, as a people, we are neither very wealthy nor very powerful; we have not yet worked out our scheme of national education at all completely; it is not yet established, as it should be, broad and harmonious, on really national lines; on the contrary, to one coming but newly from Europe, it seems in too many ways seriously provincial in spirit and narrow in result. On the other hand we have across the border-line a great nation for our neighbour, both powerful and wealthy, eager and resolute, and bent, it seems to me, on solving the problem of how to place the maximum of education and special training within reach of all. Those visitors to our meeting who have honoured us by coming from across the border, and whom we all most cordially and gladly welcome here to-day, will not, I am sure, misunderstand me, when I urge the need for our doing our uttermost, in honourable, friendly rivalry, to maintain our own position worthily alongside our greater neighbour and to strengthen our determination not to be out-distanced in that race, the goal of which is national life lived worthily, and the highest development of the intellectual life of all.

In Toronto and in Montreal we have now in Canada two schools for the training of architects. Of the former I naturally do not venture to speak in detail, standing in the presence of many who know it well and can speak with an authority in regard to it that I cannot claim. But I do not doubt that I am right at any rate in this, that in both we are still at the stage of "missionary effort" in our endeavour to promote the thorough training of young architects in the Dominion. Too often our voices are but as those of one crying in the wilderness, where there are none that listen and whence architects do not come forth. In Toronto I do not know exactly how the matter stands at present, but in Montreal, during the five years that I have been at McGill University, encouragement and discouragement have been fairly evenly commingled. Personally, however, I have had the deeply interesting experience of organizing from the beginning and planning out the lines of development for what will, I trust, prove a sound and stimulating school of training in architecture on broad university lines of education.

In so many-sided a field as architecture, which is, it seems to me, an art and a profession, both, and (perhaps) something more besides, there is room for many kinds of activity and many types of mind. To one the solution of problems of construction, with the extraordinary wealth of mechanical resource at the disposal of the modern constructor, is the side of architecture that appeals most strongly; to another, it may be rather the problems of social interest, the housing of the poor, the proper provision for the care of the sick in hospitals, or even the progress of sanitation and the realization of its laws and their requirements; to some it is the nice adjustment of plan and interior arrangement; to others it is the wider field of the composition and design of buildings as a whole and the joy of seeing thoughts take concrete form, as they are realized in actual execution.

It is significant, this many-sidedness of architecture, and justifies in a measure its claim to be at once the broadest of the arts and the foundation of the rest. It brings the architect into touch directly with almost all the other arts, professions and handicrafts, from sculpture and painting to law and medicine and to industries of very many sorts.

And the training for the architect must be broad to correspond, if he is to be adequately fitted for his work. It cannot, of course, prepare him to the extent of endowing him with all the knowledge in all the branches that he may, in the course of his practice, require to master and make use of; that is out of the question; but it should lay the foundation for such acquirement by training the mind to grasp readily the dominant factors in the problems that ask for their solution in well-balanced and harmonious architectural design.

Of the many and varied qualifications that go to make the successful architect in practice, some are of the distinctly practical type, such as business aptitude, faculty of organization and attention to practical detail, while others are as distinctly of the theoretical and academic type; most notably is this true of power in design. Between the two comes construction and engineering, leaning now to the more practical, now to the more academic side, according as it is the more ordinary, rough-and-ready, customary building, or the altogether higher work in calculation and design of the scientific constructional engineer. That this last requires mathematical and scientific training, and is a fitting subject for university instruction, surely needs no argument or proof. The enormous advances made in but recent years in modern steel-construction especially are, I suppose, for the most part the direct result of such scientific study and research. But, if we accept this main rough division into the two sides, the practical and the academic, for the former class let it be at once conceded that the best preparation is the actual stress of daily work at the office desk and the experience that is only to be gained by study at first hand in closest touch with buildings in course of actual execution. Nothing can ever take the place of such practical training, which must always remain an absolutely essential part of the preliminary equipment of an architect. No plea for academic education is ever intended to lose sight of this; nor is it the case that for this practical training academic education is either specially adapted or required. But, while those who urge so strongly that your architect must be "a practical man" are not at all beside the mark, that contention by no means covers the whole of the ground of an architect's education; it does not touch what is after all, if I may be allowed the phrase, the truly architectural side of architecture.

It is doubtless in the ordinary relations of life—though I am not quite sure that I ought to qualify the relations of architect and client as always "ordinary"—a matter of great personal convenience to be on this eminently practical footing, obviating friction and promoting smoothness that may almost be prosaic. Heaven forbid that I should not fully endorse the eminent desirability of being "a practical man."

Even the staunchest advocates of practicality, however, will admit that a great monument of architecture is not to be measured ultimately by the business capacity of its designer, but by some other and higher quality altogether. Jacopo Sansovino is said to have miscalculated the roof for the famous library of St. Mark's at Venice, and to have spent a time in jail as the result. While languishing there he doubtless came to hold a very exalted appreciation of the practical advantages to an architect of being practical; but we, and the many thousand travellers who know nothing, perhaps, of Sansovino's piteous time of incarceration, for whom the library of St. Mark's is one of the buildings that make the Renaissance architecture of Venice so fruitful and delightful a study, are apt to think less of the "practical man" than of the brilliant artist and designer, who has left us so impressive a monument of his genius and skill.

The pre-eminent quality of architecture is in truth design, and this power of design is the vital touchstone of the greatness of an architect. It is in virtue of design and composition that the great buildings of the past, differing utterly, it may be, in point of architectural style, yet, one and all, appeal to us in varying degree. Historical associations may, of course, affect us greatly; other considerations, too, may have to be allowed for in our appreciation; yet architecturally appraised all buildings owe their fame, in chiefest measure, to this power of composition and design. The same is true of our modern work. It stands to reason, therefore, that anything that will foster and quicken power of design must tend to the best equipment of an architect for his life's work.

For design, I venture to claim that academic training is the surest road for most, at any rate, to the achievement of success; that in no other way can the student readily obtain the grasp of the subject, the breadth of view, necessary to attain to the best use of the power that may be his. Design is the expression given to a building; if consistent, convincing and harmonious, the building will have dignity and the incomparable quality of Style. Slip-shod designing will mar any building and make it commonplace and lacking in distinction. With design, then, the architectural student's preparation should begin, and with design it should continue to the end, not (of course) to the exclusion of other necessary studies, but in conjunction with them. Design, it seems to me, should form the basis, the backbone (so to speak), of his course of study from the earliest moment possible, and around it the rest of his subjects should, so far as possible, be grouped. And I base my plea for university training for architects precisely on the ground of the pre-eminent importance of training in design and upon the special facilities a university course affords for carrying out such training consistently in fullest measure.

Nay, I do not hesitate to go still further and to argue that the chief objection usually urged against academic preparation for professional life, the objection, namely, that it is "unpractical," is not in itself a disadvantage in this particular connection. In studying out an architectural design, in developing his ideas so as to bring out of them the best result he can, the student must, at the outset, at any rate, be left as little hampered as possible by fettering limitations, such as economy of cost, restrictions and inconveniences of site, etc. The object of his study is to teach him to think architecturally and to express his thoughts suitably and with grace of diction in the language of his art; to mould them into forms that shall be purposeful and fitting as well as beautiful and gracious.

It is by no means an easy alphabet to learn; like any other language, if I may pursue the metaphor, it takes long to master; it means no short apprenticeship in grammar and expression; for the artistic faculties are slow of development sometimes and always require careful, even toilsome, training. My contention is that for such training no preparation, as a general rule, is more apt or better than that provided by an university course of education. It can offer a well-arranged and systematic scheme of education, such as cannot readily be equalled by any other training. Moreover, it can and does most especially develop the study of design, that being precisely the side of architecture that most lends itself to academic teaching; it thus lays special stress on what, in my view, is the central subject, the foundation of the whole, while it is precisely the subject most difficult of adequate and serious study under ordinary conditions, apart from such a systematic course. It cannot be acquired in ordinary office

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training, where a student, be he never so willing, can at best but "pick up" desultory fragments of the subject. In a busy office each assistant is bound to have his special work allotted to him, without reference to his own requirements as a student; or, if he be a beginner, all around him are too anxious to have him show that he can be of some use to them, to think of his own immediate studies as the matter of first importance to himself. Travel and study are an alternative, but I do not think they are of the most effective service till a student has both learned what to see and how to see it; and both these require the previous training which systematic study of design can best give.

As against this academic instruction, it has been urged that such a course of training will stifle genius—a charge which need not, I think, be very seriously refuted; no sincere education can so fail of its primary object, namely, to "draw out" the faculties and develop them, as to succeed in stifling the superior powers that we call genius—and, secondly, that it will tend to create a dead level of correct mediocrity, dull and wholly lacking the freshness of untrained spontaneity. This, too, appears to me hardly to need refuting. The efforts of untrained spontaneity are not generally, I fear, much more successful in design than in painting or in sculpture; in architecture they too often lead to a wholly unregenerate straining after originality, that appeals successfully neither to reason nor to good taste. And academic training fully justifies itself, if it succeeds in making mediocrity less wayward, controlling its vagaries, and sparing us those frantic abortions in design that remain a lasting instrument—potent for evil—in vitiating public taste.

I would not be thought for a moment to speak slightingly of originality; no gift can be more precious. But originality in architecture is not to be attained through the medium of blatant disregard of accepted forms of architectural expression. It is rather, it seems to me, to be attained more modestly, by absolute sincerity in design, coupled with, or rather dominated by, that rare gift, the imaginative power that naturally expresses itself in form or composition that is beautiful, not ugly. The French use the phrase "voir en beau" or "en laid," to express this faculty, or its opposite. One man will "see," or realize to himself, a design under a form that naturally lends itself to beauty of line or mass or composition; in the hands of another, on the contrary, the same idea will be embodied under forms that are less pleasing, artistically not satisfying. But I cannot think that the former will risk any loss to this admirable faculty, if he seek to educate his powers along the lines I have endeavored to suggest; while the latter may at least have the asperities of diction modified by familiarity with established and well accepted forms.

Perhaps few great architects have shown more striking originality in design than Sir Christopher Wren, in the wonderful series of churches with which he enriched London during nearly half a century after the great fire of 1666. Of them all the great cathedral of St. Paul's is assuredly his master-piece, I suppose the most beautiful and imposing church that the Protestant faith has raised. Yet, in its final form, it is a triumph of academic discipline over daring, but not successful, amateurish spontaneity. Those of you who are familiar with the design as originally approved—in King Charles I's warrant, it is declared to be "very artificial, proper, and useful"—will recall the really grotesque design for the central dome. "A nightmare conception," it has been called, "of two domes and a telescope steeple". It is even surpassed in grotesque extravagance by an earlier scheme of Wren's for the reconstruction of Old St. Paul's, in which a dome was to be "surmounted by a huge open-work pine-apple, 68 feet high, of monstrous and horrible design". Yet the dome of St. Paul's, as actually erected, is one of the most beautiful in existence, its most conspicuous characteristic being, as has well been said, "its magnificent sanity."

The reason for this astounding aberration of England's greatest architect is, probably, simply the lack of academic training. Wren entered upon the practice of architecture as an amateur, and, genius though he was, he never wholly overcame this lack of preparation for his great career; in St. Paul's itself, for which the long series of London churches was Wren's very wonderful preliminary study-ground, there are still minor blemishes in spite of years of patient study—it is idle to deny them—that seem only the result of this want of training in classical design.

Originality does not then, I take it, imply departure from traditional forms in architecture so much as honest, unaffected and gracious use of them in sincere application to the requirements of modern building. Hence it is said that I do not give my adhesion to these who would try to cut themselves adrift from the architecture of past times in order to be "modern." Not from ignorance, but from full and critical knowledge of the past can we create a tradition for the present.

It is idle to seek to evoke a "modern style" in the sense in which "Gothic" or "French Renaissance" were styles at different periods of French architectural history, when builders—both designers and workmen—were all familiar with certain current forms and methods and were restricted to these alone. With our immensely fuller knowledge, we cannot be so restricted, if we would. We can express ourselves in many ways in solution of the same problem, whereas in earlier times one, current, way only of expression was known and, therefore, consistently practiced. And modern architecture gains in this immensely fuller vocabulary, so to speak, if wisely, not extravagantly, used.

The historical study of architecture consequently forms the natural basis for architectural design. Only by knowing the best that has been done can we do the best that can be done to-day. Study of architecture in the past should not, if rightly guided, lead to mere archæological copying or repetition in our work to-day; but it should, if its lessons are properly learned and its teaching taken truly as our inspiration, bring home to us the best that the past has done and set before us an ideal that will serve us as both a standard and stimulus to solve our modern problems as honestly and well. Only out of full and loyal knowledge of past tradition can we to-day hope to achieve in our work results that will be as true and as expressive of our modern life.

In the course in architecture which I have had the privilege of planning out and developing at McGill University, I have sought to give effect to this conception. The full curriculum embraces four years, of which the first is preliminary, devoted chiefly to Mathematics, Physical Science and Drawing, with the very useful addition of practical instruction in the workshops, designed to impart some knowledge of the nature of materials of construction, to familiarize the student with the more important tools, and to give him some manual skill in their use. Only in the second year is the more special work in the different departments of architecture and engineering begun with us.

I need not dwell upon all of the work in detail; I apologize for intruding myself upon you in this direct way. I desire only to emphasize the main conception that has guided me in the organization of the architectural course.

In the first of the three remaining years the teaching is chiefly devoted to a rapid survey of architectural history from ancient Egyptian to modern times, touching successively upon the great eras of European civilization and tracing the evolution of architectural styles in their constructional forms and methods.

The student is thus placed in touch, so far as may be, with the broad lines of his subject, and the present is linked with the past in continuous development. This, it seems to me, should have an important influence on the student's attitude; for, fascinating though the archæological side of architecture may be, it is not as archæology but as architecture that the modern student should regard it.

In conjunction with these historical lectures, a course on the elements of effect in architecture and the main principles underlying the two great divisions of architectural style, the classic and the gothic, naturally, I think, arises; for want of a better name I have called it Elements of Architecture. And from the first, so soon as the student has acquired a little familiarity with the more obvious means of architectural expression, such as the Classical Orders, (which remain, I think, the best primer, so to speak, the most reasonable and effective introduction to architectural form), he is set to express himself in elementary design of plan and building.

In the next year the historical course is devoted to a study in detail of the architecture of the Renaissance down to modern times, in amplification of the earlier general course, while both third and fourth year students take together the more special courses. These comprise detailed study of ecclesiastical, domestic and public architecture, the lectures still dealing with the historic evolution of architectural styles and with the problems and requirements of modern work. A course is also given upon general art history, so as to place the architectural student in touch not only with the decorative details of the different styles of architecture, but also with contemporary forms in other branches of art, especially the decorative arts employed in building.

I have only mentioned the subjects bearing on design, as the central theme round which, in my opinion, architectural study can best be developed in an university course. I have perhaps spoken at too great length already of the work of my own department at McGill University; if so, I again apologize. But I have said scarcely anything of that other side of architecture, construction, for which the scientific training of an university course offers very direct and effective preparation. For modern construction in its more recent progress touches engineering in its completeness of calculation and in its accuracy of design. And again let me guard against the charge of disregarding the practical training needed.

In an university course it is not possible, nor is it attempted, to supersede that side of training for professional practice which is only fully to be gained by practical employment in office and on works. This, the more business side of professional work, must always be learned in actual employment under the conditions obtaining in everyday life. And such practical knowledge of the work before him should, whenever possible, be acquired by the student concurrently with the higher training the university offers, by seeking, during his free months, employment in connection with works in operation or in progress of execution.

This training is manifestly of the greatest importance for the complete equipment of the student. But, necessary as this practical training is, an university course can and does provide for something more, for a thorough grounding in the principles upon which professional practice is ultimately based, an education which can hardly ever be otherwise at all adequately acquired but which, though too often lacking, is essential for attaining the best and highest work in architecture. In design and composition—the key note of the art of architecture—success depends for the most part on the due training of the critical aesthetic faculties; and for such training the education offered in an university course is very directly and specially adapted; for most, the surest; for many, the only road.

I have limited this paper to the consideration of but one side of academic education; I have had but time to mention the other, the training on the mathematical and engineering side which is so important a factor in the modern very wonderful development of constructional engineering; the consideration of this, of course, should have, to do it justice, separate treatment at hands more competent than mine; nor have I ventured into the wider domain of the consideration of general university education, and its power to develop and broaden on harmonious lines the intellectual gifts and sympathies, and to quicken the mental life and strengthen its fibre. All that is beyond the scope of such a paper as mine to-day, which has already detained you, perhaps, too long.

Let me conclude, having thus in a sentence suggested these wider bearings of my subject, with a quotation from one of Oxford's greatest sons which sums this up in words far more eloquent than mine: "A university training is the great but ordinary means to a great but ordinary end; it aims at raising the intellectual tone of society, at cultivating the public mind, at purifying the national taste, at supplying true principles to popular enthusiasm and fixed aims to popular aspiration, at giving enlargement and sobriety to the ideas of the age, at facilitating the exercise of political power and refining the intercourse of private life." Is there any one of these great ends that should not be also the gaol of our profession, the aspiration of us all as architects?

Mr. Gouinlock: I am sure we have all listened with a great deal of pleasure to the instructive paper given us by Professor Capper of McGill University. I heartily approve of the wisdom of the Association in inviting Professor Capper to give us a paper, which I am sure will stimulate the student and the profession at large. I have much pleasure in moving a vote of thanks to Professor Capper for his very able paper.

The motion was seconded by Mr. Denison and carried.

Principal Hutton, of the University of Toronto, who was in the audience, after expressing the pleasure of the outsiders who had come to listen to Professor Capper's address said: Professor Capper said that he would not refer to the advantages that Toronto University offers for the study of architecture because we all knew them so well, but I should like to tell Professor Capper that one of the advantages for the study of architecture is unique. As Mr. Blake said many years ago "the government put up the University Building to show the public how to build, and in case the public would not then know to build, they later put up the School of Practical Science to show the public how not to build. (Laughter.) Speaking as an outsider again, I cannot help feeling that the practical side of architecture occasionally needs some little consideration. I have heard my friends tell of an architect who requiring to put a register into a bed room could not find any place where it could be put but under the bed. (Laughter.) I have also heard it said that the Society of Architects would not be perfect until they had thrown their doors open to women. I am really a little surprised not to see any here to-day, (cries of "O no," laughter.) I know there are a large number of ladies who are very anxious to show how they can build, and I am sure that women would see that plenty of pantries were put in a house, and that a window would not be put in where it would be impossible to get at it.

Professor Capper: Had the architect who built a house with a bed room in it in which you could not place a bed, an academic training?

Principal Hutton: I believe this particular architect had not an academic training. Those who suffered from his ministrations would probably be strong supporters of Professor Capper's views; but I am inclined to think that the part of Professor Capper's paper which would interest them most would be the account of Sansovino's misadventure. They would look back with regret to a time when, if an architect proved incapable, the municipal authorities were able and willing—to clap him into jail. (Laughter.)

Mr. Wright: Mr. chairman and gentlemen, I for one would like to add the expression of my appreciation of the paper which we have just heard from Professor Capper. He has covered the ground very completely, classifying the work of the student under satisfactory heads. The paper deals principally with the questions of design and scientific construction as they should be taught in our universities, while leaving the practical application to be studied by work in an office. If Professor Capper will glance through the course as laid out by this Association, he will see that we have taken very much the same view of the subject as he has. Our Association during the past year has done a good work in organizing this course, and it will do a much better work if it succeeds in carrying it out. The difficulty which we have had in forwarding the purpose of this Association throughout the province is that in the matter of the study of professional work the young men have been beginning in the wrong way. The mistake I think is in the admission of students to professional work; they have in the past been admitted too early in life and at too low a stage in their education. It has been the effort of the Association to raise that standard and it is to be hoped that their efforts will meet with success. The difficulty as far as the younger member is concerned is not so apparent to him at the time of registration, but it becomes more apparent when he comes to practice, and in the matter of guidance in this respect we have in the past not done our duty—if we have failed to require from our applicants a rigid fulfilment of the conditions necessary to qualify as students of the Association.

Mr. Hynes: (visiting member of 18 Club). It seems a unanimous opinion that a university education is desirable for an architectural student, and the question is, how are we to get the students to take advantage of this course. I think perhaps in Mr. Wickson's report there is something that is antagonizing the idea of the University course. That is the apprenticeship system. It is very hard to tie a man to two things. I think that persons who have a little money they wish to dispose of might establish two or three scholarships for the students to strive for in the University, which I think might induce students to take this course.

Mr. Symons: I should like to say a few words with reference to our educational committee. I think Professor Capper said that after all it was the design that gained distinction for an architect, and we give comparatively little credit to the man who has constructed the building in comparison to that given the man who has designed it. I think that we all agree that the men who have reached the highest stage in architecture have reached their height by their distinction in design. My own feeling has been for years that efficiency in design can only be obtained by academic training, by being thoroughly trained for that work, learning the A, B, C of the Orders and so on till we learn to design truly and well. Some people have asked me, what would you recommend to a young man as a course of training in architecture? Now-a-days we certainly make the answer that we can recommend a university training. And though it is sometimes hard for some of us to say whether it is the best, yet the longer I live I am the more ready to say it is the best, and I do not think we are dealing fairly with those who come asking admission to our offices in taking them in. We must be very careful that we are not sacrificing their interests simply to gratify our own pockets, to get them to do our work. Those of us who have gone through what we have, and in whose younger days there was not the chance of these days, must confess that our lacking is wholly I might say on account of our not having had the chances of academic training. (Applause).

Mr. Burke: Mr. President, I have great pleasure in adding my word of testimony as to our appreciation of the paper we have had from Professor Capper. Mr. Symons has touched on the difficult point with reference to architectural education, in Ontario at any rate—the tendency of students to enter an office without or before taking a proper architectural course in the School of Science. That tendency or custom can only be remedied by the architects refusing to take students who have not taken this course. The portion of our work to which Mr. Hynes referred in Mr. Wickson's report, is simply a method of getting over the difficulty with men who are now students; we feel that they should have some advantages, and it is for their benefit that arrangements have been made whereby they may have about seven hours per week at the School for lectures

on the scientific courses in connection with the Association curriculum.

Mr. Langton: Professor Capper's paper has the evangelistic quality which is most valuable in a lecture or paper. One cannot, in the short time that can be occupied by a paper, do much definite teaching, but one can stir up a spirit that will forward the end in view in delivering the paper; and this I think Professor Capper has done. There few of us I fancy who have reached, or are approaching middle age, who do not at this moment regret that the present advantages for students did not exist in our time and that we must be content with being—architects like Wren. (Laughter). The first necessity for architecture now-a-days is training. In the old days architecture was a craft. The architectural conception was common property; and to carry it out in individual cases, all the designer required was to know the grammar of its detail. The case is different now. The number of different works comprised requires a scientific training and the architectural problem is an open one, to be solved only by a mind cultivated to flexibility by exercise in the fields of thought of all generations of architects. Nothing can accomplish this training but long, continuous and practical study. That is the reason for the stand the Association takes. That is the reason for the apprenticeship system. One learns to play the flute by playing the flute. Students don't know that so much education is necessary and that so long a practical training is necessary. They see people set up as architects without it and they think they can do the same. But we know it, and it is our duty to students to lead them, not perhaps as they want to go, but as they ought to go. We have improved our curriculum and our methods. We have taken in good part all the advice the Eighteen Club, as representing youth and modern thought, gave us. We have rooms and facilities. We only want students. We have not got the students we ought to have and I am afraid in some cases they are being kept from us. I think this ought not to be the case. The architect, of whom Professor Hutton spoke, who put a bed over a register and windows in out-of-the-way places, was not an architect in the true sense of the term—in so far as he did these things. I think also that the case of Sansovino's roof is exceptional. It is a commonplace among architects that the architect who is an artist is also a good constructor. An architect is not a mere designer of exterior appearance. In my own mind I separate the word designer from the word architect. Architect is an inclusive term. The architect conceives the building as a whole. The plan is at the bottom of everything and a plan is not a plan that is not conceived of as a thing to be built. The best architect is the best builder.

THE BEHAVOIR OF STEEL UNDER STRESS.*

By Prof. C. H. C. Wright, School of Practical Science, Toronto.

While discussing with one of the members of the Council of this Association the results of certain experimental work of the post-graduate year at the School of Practical Science I was induced to promise a paper on the behavior of steel under stress and in its preparation I have kept in view the younger members and students of the Association.

Inasmuch as the use of steel has completely revolutionized methods of construction and plan, its effect should be and is apparent in the design, nut however, to the extent the material deserves. It has been the custom for years to use rolled shapes, rivets, and joints of an engineering type partly because this branch of the work has been generally relegated to the engineer, and partly because most of the steel work is hidden. Is not much of it hidden because it is considered unsightly? Why should not the parts exposed to view be æsthetically treated and the shapes receive architectural attention.

It has always been considered necessary to study carefully the properties of other building materials. The successful treatment of granite shows boldness or vigor; marble, delicacy or refinement; sandstone, elaboration; terra-cotta, repetition, etc.

While steel has been used very largely during the last decade it will be used much more extensively in the immediate future. It becomes desirable that the members of our profession should, and imperative that the younger members shall, observe closely the peculiar properties and behavior of this important material in order that it may be treated satisfactorily in design as well as in construction. It ought not and cannot be left to the engineer.

Another difficulty that might be mentioned is the action of fire on steel. Serious as this difficulty is from the point of view of design, it must be met frankly and not forgotten that this very same property enables it to be rolled and worked into shapes economically.

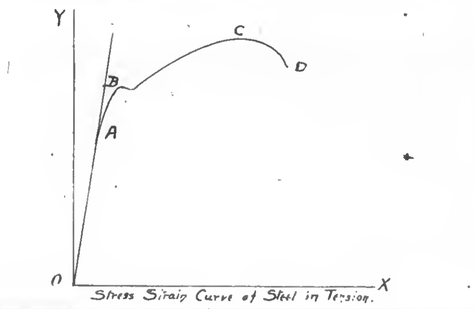
Interesting as this line of thought is, we must turn our attention to the more elementary stages and consider a few of the properties of steel.

Suppose a steel rod (usually 24" long) is placed in a testing machine and a load applied so as to produce tension in the rod. Now if measurements of the lengths of a part of the rod (usually 8") are made it will be found that for every load applied or stress there is a corresponding change in length, a deformation or strain. Further, that when the load is removed the rod will regain its original length.

There is a point however beyond which this is not true, or where the deformation or strain is not constant for equal increments of load or stress. Below this point steel is elastic, while beyond it is plastic. The point at which this change occurs is called the elastic limit. If however a piece of steel be stretched (strained) beyond the elastic limit, and the load removed, it will contract more or less but will not regain its original length.

The measurements of deformation or strain, which must be accurate to the nearest 1-10,000 of an inch, are made with an extensometer of which this Riehle Yale represents a very satisfactory type. As will readily be seen, the points of the screws which fasten it to the specimen are held rigidly 8" apart. After fastening it to the specimen, the bar connecting the two heads is removed, and the two micrometers read or set at zero (the contact being determined by the ringing of an electric bell on the closing of the circuit by the contact). A load is next applied to the specimen, and the micrometers again read, the difference between the two sets of readings, giving the deformation or strain corresponding to the load or stress. If the stress be doubled the micrometers will show that the strain has been doubled. As the stress is increased it will be found that equal increments of load will produce equal strains so long as the steel remains elastic, or in other words within the elastic limit.

If these measurements were continued and the resultant stress strain curve drawn, plotting the loads as vertical ordinates, and the strains as horizontal abscissa, it would resemble O A B C of the accompanying figure.



Stress Strain Curve of Steel in Tension.

In the complete curve there are four significant points, viz., the true elastic limit, A; the apparent elastic limit, B; the ultimate strength, C; and the breaking point, D. From O to A the ratio of stress or strain or load to deformation is constant and the curve becomes a straight line. Between A and B the ratio of strain to stress increases slightly, while at B a very marked change takes place, hence the term "apparent elastic limit." Micrometer measurements of the length are not necessary to determine this point, and consequently it is widely used in commerce, and is often spoken of as "the commercial elastic limit," or often merely "elastic limit." Beyond the elastic limit the material continues to increase in length as additional loads are added until it reaches its ultimate strength, when it begins to fail. It no longer continues to support the load, but stretches under a decreasing load and finally separates under a greatly reduced one such as is indicated in our diagram by the point D.

Specimen No. 1 is a mild steel made by the open hearth process and gave the following results when tested in tension. The length of the specimen was 24 inches and its diameter 1".015. Punch marks one inch apart were made along the rod. The specimen was then placed in the testing machine and subjected to tension. The load was gradually applied and the material elongated uniformly for a time until it reached a point where it stretched under a constant load of 21,000 pounds, i. e. the commercial elastic limit of 21,000 ÷ (1.015x3.14159) i. e. 21,000 divided by the cross section of the rod or 27,200 pounds per square inch. The rod finally broke under a load of 37,700 pounds or of 37,700 ÷ (1.015x3.14159) or 47,200 pounds per square inch of its original cross-sectional area. On measuring the distance between two of the punch marks originally 8" apart (4 on each side of the break), it was found to be 11.08" long; i. e. the steel had an elongation in 8" of 38.5%. Collecting we have :—

Commercial elastic limit .... 27,200 pds. per sq. in.
Ultimate strength ..... 47,200 " "
Elongation in 8 inches 38.5%

The following measurements made on this specimen will show perhaps more clearly the elasticity of the material.

Load in Pds.	Stress in Pounds per sq. inch.	Extensometer readings.	Deformation of Strain.
1,000	1237	8.0005	0.0005
2,000	2474	8.0009	.0004
3,000	3711	8.00125	.00035
4,000	4948	8.00160	.00035
5,000	6185	8.00195	.00035
6,000	7422	8.00225	.0003
7,000	8659	8.0026	.00035
8,000	9896	8.00295	.00035
9,000	11133	8.00325	.0003
10,000	12370	8 00355	.0003
11,000	13607	8.0039	.00035
12,000	14844	8 00425	.00035
13,000	16081	8.00455	.0003
14,000	17318	8.0049	.0003
15.000	18555	8.0052	.00035
16,000	19792	8.00555	.0003

On drawing this stress strain curve, plotting the stresses as vertical ordinates and the strains or deformations as horizontal abscissae we get the following diagram.

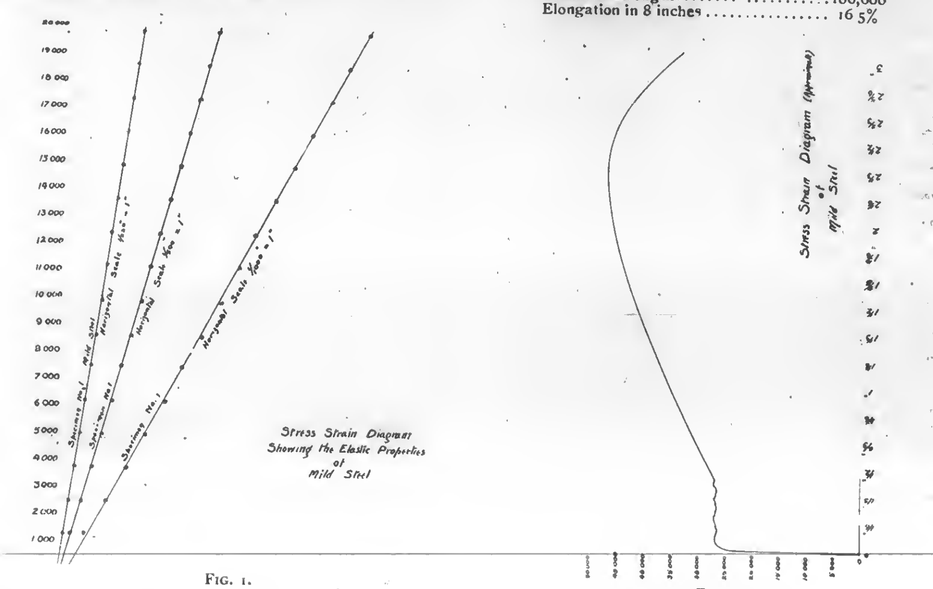


Fig. 1.

The complete stress strain curve is given in Fig. 2.

Specimen No. 2 of Milo Steel, made by the open hearth process, gave the following results in tension:—

Length of specimen, ... 24 inches.
Diameter of specimen, ... 1.015 inches.
Apparent Elastic Limit, ... 27000 pounds per square inch.
Ultimate strength ..... 47500 pounds per square inch.
Elongation in 8 inches, ... 38.0 %

Load,	Stress in Pounds per Square Inch.	Extensometer Readings	Elongation.
0	0	.27135	
1000	1237	.27185	.0005
2000	2474	.27235	.0010
3000	3711	.27265	.0013
4000	4948	.27290	.00155
5000	6185	.27325	.0019
6000	7422	.27355	.0022
7000	8659	.27395	.0026
8000	9896	.27430	.00295
9000	11133	.2746	.00325
10000	12370	.2749	.00355
11000	13607	.2753	.0039
12000	14844	.2756	.0043
13000	16081	.27585	.00455
14000	17318	.27655	.0049
15000	18555	.57655	.0052
16000	19792	.2769	.00555

Specimen No. 3 mild steel made by the Bessemer process gave the following results in tension :

Length of specimen ..... 24"
Diameter of " 1.0155
Apparent elastic limit ..... 29,500 pds. per sq. in.
Ultimate strength ..... 46,400 " "
Elongation in 8" 40%

Load.	Stress in pds. per sq. in.	Micrometer Readings.	Elongation.
		.5578	
1000	1229	.5581	.0003
2000	2457	.5586	.0008
3000	3685	.5591	.0013
4000	4914	.5595	.0017
5000	6145	.5599	.0021
6000	7371	.5602	.0024
7000	8600	.5606	.0028
8000	9828	.5609	.0031
9000	11050	.5612	.0034
10000	12290	.5616	.0038
11000	13510	.5620	.0042
12000	14740	.5624	.0046
13000	15970	.5627	.0049
14000	17200	.5629	.0051
15000	18430	.5632	.0054

Specimen No. 4 of machine steel gave the following results in tension :

Length of specimen ..... 24 inches
Diameter of specimen 1.014
Apparent elastic limit ....
Ultimate strength 100,600
Elongation in 8 inches 16 5%

Fig. 2.

Load.	Stress in Pounds per Square Inch.	Extensometer Readings.	Elongation.
1,000	1273	.3837	
2,000	2547	.3840	.0003
3,000	3820	.3844	.0007
4,000	5093	.3848	.0011
5,000	6366	.3852	.0015
6,000	7640	.3856	.0019
7,000	8913	.3860	.0023
8,000	10190	.3864	.0027
9,000	11460	.3868	.0031
10,000	12730	.3872	.0035
11,000	14010	.3876	.0039
12,000	15280	.3879	.0042
13,000	16550	.3883	.0046
14,000	17830	.3887	.0050
15,000	19100	.3890	.0053
16,000	20370	.3894	.0057
17,000	21640	.3897	.0060
18,000	22920	.3901	.0064
19,000	24190	.3904	.0067
20,000	25470	.3908	.0071

Figure 3 is the stress strain diagram of specimens Nos. 2, 3 and 4 within the elastic limit. Allowing for reasonable errors of observation the line joining the plotted points is a straight line showing conclusively that steel is within these limits perfectly elastic.

Before looking at the classification of steel let us examine very briefly its composition and process of manufacture.

Cast iron as you will remember is a combination of from 2 to 6

*Paper read at the annual meeting of the Ontario Association of Architects, Toronto, January, 1902.

per cent. of carbon with iron. The large amount of carbon determines its characteristic features or behavior. Wrought iron is the product resulting from the removal of carbon from cast iron. This leaves with the wrought iron such impurities as sulphur and phosphorous. When these are present in too large quantities they render the iron red short or cold short respectively.

Steel is a combination of iron with a percentage of carbon varying from minute quantities to as high as 2%. It is manufactured in the three following ways, viz.—1. By adding carbon to wrought iron—the product of such process being known as crucible steel. 2. By removing carbon from cast iron—the product of this process being known as Bessemer steel. 3. By melting together cast and wrought iron—the product of this process being known as open hearth steel.

Cast iron is hard and brittle and can be moulded, while wrought iron is soft and ductile and can be welded. Steel is unlike wrought iron in that it is fusible, and unlike cast iron it can be forged, and with the exception of high grades it can be welded. In addition to these advantages the higher grades can be hardened and tempered.

The term steel is applied to a class of materials which cover a very wide range of properties. One particular grade may be soft and ductile while another is quite hard and brittle. In tensile strength they may vary from 40,000 to 200,000 pounds per square inch.

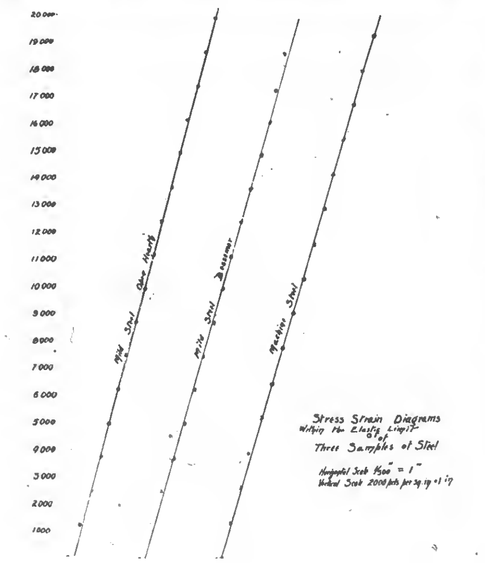


FIG. 3.

It is now customary commercially to classify steels either according to their properties or uses. In the one group there is mild, medium or hard steel, while the other classification includes rivet steel, boiler plate, structural, machine, tool and spring steel, etc.

The following table gives a few of the characteristic physical properties of these different classes:—

Rivet steel should be ductile rather than strong and should have an ultimate strength of 40,000 to 55,000 pounds per square inch; elastic limit, 30,000 to 45,000 pounds per square inch; elongation in 8" = 25 to 35%.

Boiler plate—Ultimate strength 50,000 to 65,000 pounds per square inch; elastic limit, 30,000 to 45,000 pounds per square inch; elongation in 8" = 25 to 30%.

Structural steel—Mild, ultimate strength 40,000 to 55,000 pounds per square inch; elastic limit, 25,000 to 35,000 pounds per square inch; elongation in 8" = 25 to 35%.

Medium—Ultimate strength, 55,000 to 70,000 pounds per square inch; elastic limit, 35,000 to 45,000 pounds per square inch, elongation in 8" = 20 to 25%.

Machine steel—Ultimate strength, 80,000 to 110,000 pounds per square inch; elastic limit, 55,000 to 70,000 pounds per square inch; elongation in 8".

Tool steel and spring steel—Ultimate strength, 120,000 to 200,000 pounds per square inch.

The standard specifications for structural steel proposed by a committee of the American Society of Civil Engineers in 1896 is as follows:

	Lbs. per sq. in.
"Tensile strength low steel	60,000 + 4,000
" " medium	65,000 + 4,000
" " high	70,000 + 4,000

Elastic limit 55% of the ultimate strength of the specimen.

$$\text{Per cent elongation in 8 in.} = \frac{1{,}500{,}000}{\text{Ultimate}}$$

$$\text{Per cent reduction of area} = \frac{2{,}800{,}000}{\text{Ultimate}}$$

Rivet steel when heated to a low cherry-red and quenched in water at 82° Fahr., must bend to close contact without sign of fracture. Specimens of low steel when treated and tested in the same manner must stand bending 180° to a curve whose inner radius is equal to the thickness of the specimen, without sign of fracture. Specimens of medium steel as cut from the bars or plates and without quenching must stand bending 180° to an inner radius of 1½ times the thickness of the specimen, without sign of fracture. While those of high steel also without quenching must stand bending 180° to a radius of twice the thickness of the specimen without sign of fracture."

In connection with the latter part of this specification the following test may be interesting and instructive.

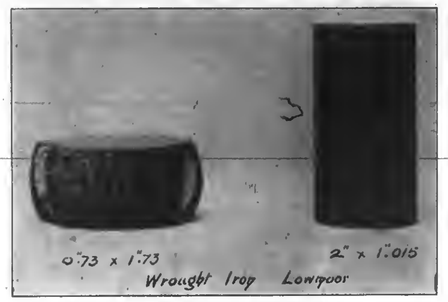
Two specimens, one of mild open hearth and the other of machine steel were heated to a cherry-red, quenched with water and tested with the following results:

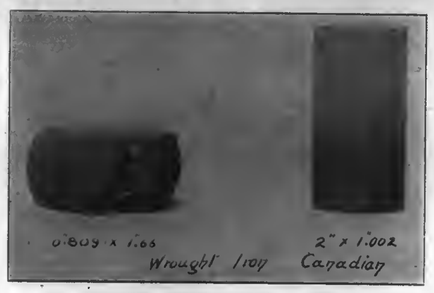
	Ultimate strength pds. per sq. in.	Elastic limit pds. per sq. in	Elongation in. 8"
Mild steel	47,200	27,200	38.5%
Mild steel hardened	62,200	43,000	broke in strips
Machine steel	83,900	55,600	21%
do hardened	106,000	60,500	2%

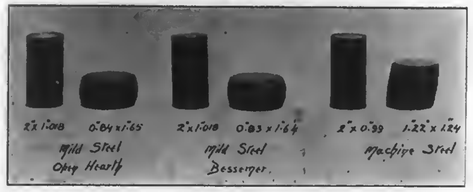
While almost every specification mentions maximum and minimum tensile strengths it is very seldom that mention is ever made of the compressive strength, although the material is used quite as frequently in compression as in tension. This is because the ultimate strength, elastic limit and deformation or strain are more readily determined in tension than in compression, and because the results in tension are the same as those in compression.

Under a uniformly increasing load steel in compression contracts uniformly within the elastic limit, which fortunately is the same as that for tension. When the load increases beyond the elastic limit the material simply spreads and increases the area of its cross-section indefinitely, so that in compression steel has no ultimate strength. This is well illustrated in the following specimens, originally 2 inches long, which were subjected to a load of 170,000 pounds each.

Specimens numberd 1, 2, and 3, are wrought iron, made in Sweden, England and Ontario respectively; while numbers 4, 5 and 6 are mild steel open hearth, mild steel Bessemer, and machine steel. Those specimens which are cracked open or are etched show very clearly the flow of the material under the stress.







The stress strain diagram for steel in compression when the stress is determined by dividing the load by the original cross-sectional area is as indicated in the annexed diagram, FIG. 4.

These compressive tests were made on a Riehle 200,000 pounds machine, and as the screws were kept running at a uniform rate, a set of readings of the times required to produce the stresses were registered on a chronograph simultaneously with the measurements of the deformation or strain. On plotting from these results the stress strain curve and the stress time curve, it is found that they were identical when the scales correspond.

Mr. Pearson: Whilst listening to Mr. Wright's very able paper, I have been brought to look upon the action of stress upon the elements that compose iron and steel in a different light from what I have hitherto regarded it. When such building materials as stone and wood are subjected to stress one can readily understand the action that takes place. In the first instance, when stone is subjected to pressure, the small molecules are disrupted from their setting in the basic cement and the material begins to fracture and crumble away. In the case of wood, the fibres begin to slip past or tear apart from each other. Now, in the case of steel, if I understand Mr. Wright, this action is altogether different. When stress is applied the substance begins to flow. Perhaps I should not say altogether different, but the nature of the substance, as we conceive it is so very different from that of stone or wood, in that it is a more unified or compact mass, that the strain, the resultant of the stress, travels through it, or is transmitted, or flows through it, more in unison with the inherent conditions that are generated by the stress. There is a something in the nature of steel, its elasticity, its plasticity, its resilience, its resistance, its recuperative powers, in that up to a certain point it will again assert itself, or assume its normal condition—that, of all the materials we employ, places it in a class by itself. Now it is because of these integral qualities, that there is a greater unison, a closer affinity between the elements that compose steel and the conditions that arise when strain is present. What is this substance, what is—steel? We seem to know very little about it. We understand it to be composed of innumerable crystals, and these crystals, I suppose, are composed of atoms. Now, imagine a

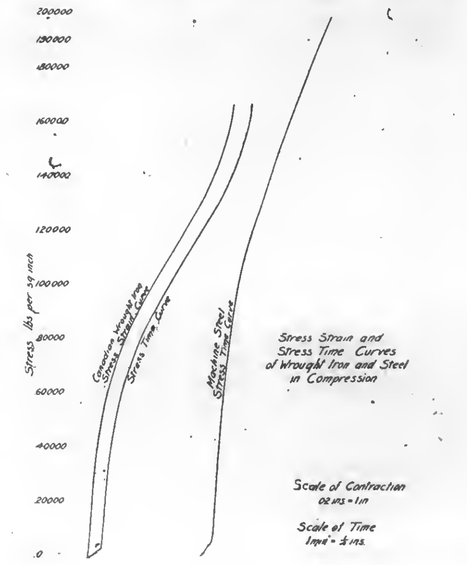


FIG. 4.

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piece of steel under compression; the atoms or crystals that compose it begin to flow. Are these crystals of such hardness and density that they cannot assume another form and therefore must necessarily move around or upon each other, or do they adapt themselves to the conditions and elongate and compress inherently? What is this adhesive property that binds them together under stress, as the substance itself becomes more compact or elongated? Is it a cement? Is it the attraction of the atoms themselves? It seems to me we want to know more about the composition of steel, its simple elements and their properties, before we can understand the action of strain in the substance. It may be the association of ideas, but when Mr. Wright used the word flow, I immediately thought ot liquids, (Laughter), and I think it would enable us to understand more clearly the action of stress on steel if we could conceive it as a rigid fluid. I would qualify the adjective to the extent of the action of stress upon steel; or, take a bar of soap and we can more readily understand this action of compression or elongation. Mr. Wright has shown us a number of tests with widely differing results, and in some cases by merely hardening the steel, the results vary from twenty-five to fifty per cent. He has carefully led us step by step into such a bewildering maze of tests and figures, and left us there, that I think we feel justified in asking him to tell us what factor of safety we are to employ in the future. (Hear, hear.) In the earlier part of his paper Mr. Wright briefly touched upon the architectural aspect of engineering, wondering if it were not possible for the architect to evolve an aesthetic section of a steel beam or column, exposing them and treating them as part of the design. There are tremendous possibilities in this proposition. Imagine the section of a steel beam in the Queen Anne style, or a Romanesque channel, and then think of it—think of the midnight oil consumed by the engineer in locating the elusive "moment of enertia" or the "radius of gyration" of such fantastic shapes! (Laughter). Until a fire-resisting steel is manufactured, or a steel of something more than the nondescript colour it is at present, a colour that is pleasing and integral, we are justified in painting to get the desired effect, or in covering with such materials as will protect it against fire. (Hear, hear). From the standpoint of economics, in that the shapes that are rolled are universal and are of such contour that they lend themselves readily for assembling, in that the effort is to obtain the greatest strength with the least area of cross-section, or until that day dawneth when we shall view with a sense of exquisite pleasure the lines of a Z bar column, let us "rather bear the ills we have than fly to others we know not of." It is beyond question that the science of engineering has kept pace with the times, manfully meeting and solving the problems that the advancement of civilization unearthed, whilst its kindred profession has been content with the laurels gained in An-

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The Canadian Architect and Builder

VOL. XV.—No. 170. FEBRUARY, 1902.

ILLUSTRATIONS ON SHEETS.

New Buildings, Queen's University, Kingston, Ont:—Messrs. Strickland & Symons, architects.

ILLUSTRATIONS IN TEXT.

Cottages in Connection with the Sanitorium for Consumptives at Gravenhurst, Ont.
Block Plan of Buildings, Queen's University, Kingston, Ont.
Plan for Re-Arrangement of Toronto Industrial Exhibition Grounds, submitted by the Ontario Association of Architects.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Photogravure Plates—Exterior and Interior of English Cathedral, Montreal—John Wells, architect.

CONTENTS

Editorial 21-22
Sewage Disposal of Suburban Houses and Public Institutions 23-24
Province of Quebec Association of Architects . . . 25
Design as an Element of Practice 26-27-28
The Improvement of the Grounds of the Toronto Industrial Exhibition 29
Queen's University Kingston, Ont. 30-31
Cathedral Architecture in England ix
Notes x
New Glass Bending Oven xi
A Correction xi

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" J. C. B. HORWOOD, Architect, Toronto.
" A. F. DUNLOP, R.C.A., Architect, Montreal

Union League Club House, Chicago

The competition for the Union League Club House is an instance of a successful competition. It was a limited competition for which three well known firms were engaged, the losers to be paid $1000 each. As the proposed cost is $800,000, and the successful architect's fee $40,000, the expense fee, promised to unsuccessful competitors, is a bagatelle to the promoters, and secured them a good competition. If any building is of sufficient importance to make a competition worth while, it is worth while to spend some money in the competition. The conditions of competition are published in the Inland Architect for January, along with the plans. There is no mention of a professional advisor for deciding the merits of the plans. Decision lay with the building committee of the Club. But considering what a city Chicago is for eminent architects and that they are probably all members of the Club, the building committee was most likely an unusual building committee. The competing architects had also an opportunity of appearing before the committee, before the final decision was made, to give a detailed explanation of their plans. This was also a good feature. The result secured is a wonderfully fine plan by Mr. Burnham which seems upon examination to justify without doubt the choice of the committee.

Winter Transplanting of Trees.

An interesting piece of work is being done at St. Louis, in preparation for the World's Fair. The Fair, which is to be placed in Forest Park, where are many large trees, will require the removal of 700 trees; but, both to preserve the trees and to have the advantage of their shade for the Fair, they are to be transplanted so as to line the broad avenues which will remain as a feature of the park when the Fair is over. As the trees are from 12 to 18 inches in diameter, this is an undertaking of more than unusual difficulty, and it will not do to waste time in failure. It is in the method employed to insure success that the interest lies for us. The trees are to be lifted during the winter, while they are dormant and when the ground is frozen so that the earth in which the roots are set may be carried away bodily. There is a suggestion here for another way than the heart-breaking destruction that is sometimes found necessary when a fine tree stands in the wrong place on a building lot. If the transplanting project of the St. Louis Fair is successful, we who have so much more frost—whose trees must be if anything more dormant, or at any rate dormant longer, and who can be sure of removing a greater depth of frozen earth—ought to be able to move a large tree within a lot, or bring to the lot from elsewhere trees that it would take more than twenty years to grow.

The Naming of Floor Plans

A proposition was made at one of the weekly lunches of the Toronto Chapter of the Ontario Association of Architects, recently, that members of the Association should agree to adopt a uniform nomenclature when entitling the floor plans of a building. It was further proposed that the system adopted should be the American system of abandoning the use of the term "ground floor," and calling the floor immediately above the street the first floor. There was some discussion on the reasonableness and simplicity of the American system, but it was

decided that usage alone should settle a question of this kind. It certainly seems as if usage that requires an edict in its favor cannot be called predominant yet. There is reasonableness in the English system too, and a certain descriptiveness which is strong in the mind of anyone who has been accustomed to its use. It is interesting to note that in Mr. Burnham's plan for the Union League Club House, Chicago, the entrance floor is called the ground floor. It is only two steps above the street and is devoted to such uses—the office, telegraph, telephone, coat rooms, lavatories, barber shop, etc.—that it seems proper to call it the ground floor and leave the term "first floor" free for the floor above, which is entirely given up to what the architect calls a "State Suite." Herein is a moral which may often be found in American affairs,—that the most American practice is not always the best American practice; that in the higher developments there is a tendency to return to an old world way of doing things. Let us, who inherit in many things the way of the old world, make quite sure, before we change, that a change is necessary.

Theatre Exits.

The manager of a theatre in Montreal had to appear in court the other day, at the instance of the Inspector of Buildings, because on a single date his programme had not fulfilled the terms of the building by-law, that on every play bill shall be printed a plan of the theatre showing exits and stairways. This is an excellent regulation. It secures an exhibition of the floor plan in a place where it is sure to receive study, along with the jokes and advertisements on the programme which get such careful attention during the waits. To make the regulation fully effective there should be some provision in the by-law for a manner of representation that would invite attention, and a scale of drawing that would be understandable, so as to guard against mere compliance with the letter of the law by the insertion of a half-inch blot that would represent nothing to the inexpert, for whom it is most intended. An incidental advantage of the prominence thus given to exits would be to dispose theatre proprietors more to their consideration. If the law requires a nightly display of the exit qualities of a theatre, it is likely that some pains will be taken that this part of the plan may bear inspection. If, for instance, the plan of the Toronto Opera House were made prominent on the programme it would say in the plainest language that for the sake of space to let in the front of the theatre the lives of visitors to the theatre are nightly endangered, from the way in which the audience from the floor and the balcony are brought to a common exit. The streams from the balcony on each side enter at right angles the stream from the floor. It is true that a balustrade is interposed at the bottom of the balcony stairs to turn the flow from the balconies in the same direction as that from the floor, but it would not stand for a moment a panic rush; and its wreck, thrown down under foot, would insure catastrophe. If the balustrade could stand, the people from the floor might perhaps escape, but what would happen to the people rushing down from the balcony? At the bottom of the stairs from the balcony, which is about six feet wide, they would find a fence, about four feet from the bottom step, obliging them to turn at right angles through a door three feet four inches wide. This is a fine illustration of the feat known as coming out of the small end of the horn. If set down in plan it would look like the section of a sausage machine; and those persons who object to theatres, and hand tracts to people who come out of them, might make use of it to hand to them going in as a graphic representation of the tract entitled, Prepare to meet thy Doom.

Canadian Building Stone.

It is surprising that the abundant building stone of this country is not more widely used. There is plenty of it and in great variety. A valuable paper read before the Ontario Association of Architects by Mr. Andrew Bell, and printed in the CANADIAN ARCHITECT AND BUILDER for March, 1896, ought to have had more effect than it appears to have had in introducing some Ontario stones to notice. Recently the Pan American Exposition has afforded an opportunity which has been to some extent taken advantage of by the Bureau of Mines in making the mineral exhibit of Ontario. The first consideration with the Bureau of Mines was an exhibition of ores but incidentally there was a very fine exhibition of building stone, and the descriptive catalogue of this exhibit should be in the possession of architects who are in the way of using stone. There were eight kinds of granite shown; half from the Lake

MR. W. A. LANGTON,
President, Ontario Association of Architects.

Superior neighborhood and half from that of Lake Ontario. The best specimens were exhibited by the Bureau of Mines itself, showing presumably that there is as yet no commercial development. There was a fine red from Brule Point, L. Superior, and a beautiful grey from Ignace on the C. P. R. in the Rainy River district, where the material is said to be found in immense quantities. The only private exhibitors were T. Sydney Kirby of Ottawa, who showed a sample of grey granite and W. C. Caldwell of Lanark, Ont, who had a dark red. There were twelve examples of Syenite, which looks like granite and often takes its place in ornamental work. The only commercial exhibit was perhaps the most beautiful, a polished block of dark, solid green from Gananoque quarries, sent by T. J. Stewart, Hamilton Granite Works, Hamilton. Sandstone is said in the catalogue to be of common occurrence throughout the eastern and southern parts of the Province. The Credit Valley and Medina sandstones of Messrs Carroll & Beharriell's and Carroll and Vick's quarries are well known. There was also a good red stone of a rather dark colour sent by the Chicago and Vert Island Stone Co., Port Arthur, Ont. Other exhibitors were F. N. Gibbs, Port Arthur; the Cataraqui Quarry Co. Kingston, Ont., and L. O. Armstrong, C. P. R. Offices, Montreal. F. N. Gibbs also sent some cut

blocks of white stone from Thunder Bay. Limestone is said to be abundant in the southern peninsula and the eastern counties. There are quarries at Queenston, Merritton, Beamsville, Wolfe Island, Guelph, Ottawa, Belleville, Huron county and other places. Marble, if one may judge by the number of exhibits, is even more abundant. There were twenty-eight exhibits of marble but most were by the Bureau of Mines. There were all colours—white, black, grey, green and shell pink. There was one piece of statuary marble sculptured; but in most specimens there was some marking. The specimens were said to have been all taken from the surface or near the surface and a more uniform and better quality is promised for deeper development. When will this development take place? The principal beds of marble in Hastings, Leeds, Renfrew and Frontenac counties are not far away from the principal building centres on Lake Ontario; and the Thunder Bay district, which supplied the remainder for this exhibition, is easily accessible by water. It seems safe to predict a market, if wealth continues to grow as it has recently. The use of good material in building will easily become a commercial necessity, and nothing will have a more important influence in developing good architecture.

THE SEWAGE DISPOSAL OF SUBURBAN HOUSES AND PUBLIC INSTITUTIONS.

BY DR. P. H. BRYCE.

It gives me pleasure in complying with your invitation to prepare a paper on some sanitary problem connected with your work, to present a paper on the title indicated, as being of extreme importance, connected as it is, directly with the problem of "Pure Air in Houses," which I discussed before you last year.

As we are well aware, there is a more or less marked difference in the air of country places and of towns and cities, indicated by a small excess of carbonic acid (Co_2) in the latter and the absence of ozone, or oxygen in a nascent condition, due to the excessive presence in towns and cities of organic matters on the surface, in houses, lanes, manure heaps, drains and so on, constantly undergoing decay or reduction to simple compounds by the action of various living organisms, especially bacteria, which utilize oxygen in their biological processes. Sometimes they find this oxygen in the organic compound itself, especially in the azotic or nitrogenous compounds but also in the carbon compounds of a starchy character; in other and under ordinary circumstances, they utilize the oxygen free in the air. As will be supposed, there are different species or classes of this minute form of largely vegetable life, some of which do not thrive in free oxygen and air and some forms what live within the bodies of animals and external to them in free air as well.

To the first class Pasteur long ago gave the name an-aerobes or microbes living apart from air, and the second he called aerobes or those which require free oxygen for their development.

The two classes have properties differing more or less from one other, one especially peculiar to an-aerobes being the liquefying of organic compounds by growing into these and really dissociating their solids, as, for instance, gelatine, forming, of course, by-products during the process both of gaseous and liquid character. The constitution of these chemical compounds varies; that of the gases being principally CO_2, H_2O, H_2S, and many highly organized volatile compounds, such as those given off by the breath of man and animals, those from the many foods and fruits, which develop during their mellowing and decay, and especially the extremely unpleasant emanations given off from putrifying meat, fish and the solid wastes, which pass off to the sewers as excreta, and kitchen and house wastes of every sort. It is a fortunate fact that the products of aerobic decomposition are less disagreeable and injurious than those from an-aerobic decay, since such are those which are most constantly exposed to air from surface decomposition of outside matter everywhere. With these preliminary remarks it will be easy to see something of the nature of the problem to be dealt with in disposing, safely and conveniently, the house wastes which go by the name of sewage, or those matters which are conveyed by water into underground pipes or sewers.

It is the experience of every local health officer, and a source of constant difficulty to the Provincial Board, that in those towns where a sewerage system does not exist and in many houses in the suburbs of towns, even where such systems are, in rural districts and in the large temporary summer resorts, hotels and cottages, the problem of what to do with excretal matters, both animal and vegetable, has been everywhere, if not difficult, yet the most constant one which the local boards have to deal with in the matter of nuisances, and which in many cases proves the most constant danger to the household immediately interested, and where streams or lakes are polluted, not unfrequently has become the occasion of some sudden and serious outbreak of typhoid fever or diarrhoeal disease. The fact that 253 examinations of water were made during the past year at the Provincial Laboratory, most of them due to outbreaks of typhoid, shows that the causal relationship between polluted water and typhoid and diarrhoea is well recognized, and general observation, as well as laboratory work is quite agreed as to the direct connection between such pollution and some accumulation of decomposits of animal or vegetable matter. Privy vaults, deep pits, or cess pools, constant contamination of the area around the house pump with kitchen washings and slops of every kind, hotel stables and barnyards, soakage from slaughter houses, the wastes from cheese factories and creameries and the heaps of refuse from canning factories, and indeed every kind of manufactory in which organic products are used, may become direct means of pollution to wells and sources of public water, and many are moreover the cause of serious injury to health from their creating effluvium nuisances.

Now, perhaps, gentlemen, as it may be only occasionally that as architects you are called upon to deal with more than one of these sources of ill-health, viz., this one of the disposal of house sewage, including excreta, kitchen and chamber wastes, in places where there are no public sewers, it is most essential that some general principles should be laid down and acted upon with a view to the safe, economical and aesthetic method of disposing of such organic wastes.

Probably every one here accepts the theory that in the economy of nature nothing can be lost, or that matter is indestructible, and perhaps all will, in a general way, agree that whatever is yielded by the soil, as, for instance, the potash, phosphates, ammonia and so on, which are contained in the grains and other fruits of the earth, should be given back to Mother Earth for her goodness to us. So in spite of man's foolish waste and ignorance, they ultimately are returned to her, but at an enormous cost of time and energy. Carried to the sea, sewage will form deposits ultimately forming new land, or in solution will become the food of microscopic vegetable forms of many species of the deeper ocean planton and of the larger plants of the ocean littoral, which in turn becomes the food of the microscopic infusoria and finally the food of fishes, molluscs and other sea animals, and so is brought back finally as food to man. Were we intelligent and careful we would see to it that not a single pound of organic waste matter is allowed to decompose out of its place, in other words, to so act as to return to the earth every ounce of C, H, O, and N, which taken from the humus or upper layer of soil is year by year being used up by cultivation and must be returned there, if fertility of the soil is to be maintained.

As however, it is found in practice in most parts of this country that there is a lack of appreciation of the manureal value of such materials, and that the adoption of what is known as the dry-earth system in houses and institutions has not proved free from objections, owing to neglect to supervise it carefully, owing to its cumbersomeness, and as moreover it does not do away with either the need for water pipes and a supply of water being laid on in the better houses, or of the need for disposing of the kitchen and chamber wastes, in any case it is evident that the growing appreciation of modern conveniences in houses is demanding some systematic method for dealing with all house wastes, whether for kitchen or closet by the water-carriage system.

I propose, therefore, to indicate how in practice such a system may be established, at once efficient and economical. In the annual report of the Provincial Board of Health for 1898 a chapter is devoted to "The Biological Principles Involved in the Purification of Sewage," which to those interested will be found to contain a very full discussion of the scientific principles of this whole matter. There will be found a table giving the average analysis of town sewage. While probably less concentrated than the sewage of a single house, since it would contain water from factories, from sub-soil drainage and so on, yet it will very well serve as an illustration of the contents of sewage. It is as follows:

1. Solid matters in suspension—
   - (a) Organic.....20 grains per gallon.
   - (b) Mineral.....10 " "
   - Total.....30 " "
2. Solid matter in solution—
   - (a) Organic.....20 grains per gallon.
   - (b) Mineral.....50 " "
   - Total.....70 " "

Or expressed in parts to 1,000,000 such a sewage would yield:

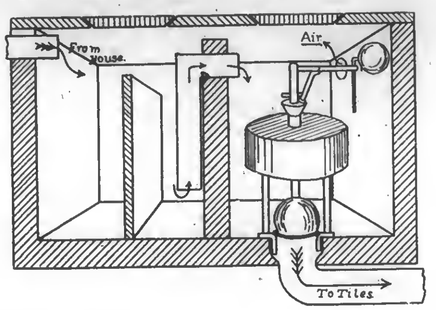
Total Solids.	Solids in Suspension.	Chloridne.	Free Ammonia.	Albumenoid Ammonia.
1428.0 parts	428.0 parts	120.0	50.0 parts	10.0 parts

Assuming what is in experience ample, 20 gallons per head per diem of sewage, it will appear that for an ordinary dwelling with 10 inmates, with a water supply laid on, there will have to be disposed of daily 200 gallons. By reference to the analysis it is clear that half the organic matter, or that in suspension, could easily be removed by any crude filtering method, as by a screen, a grit chamber, or even by passage over coke or some readily destroyed material, should it become clogged.

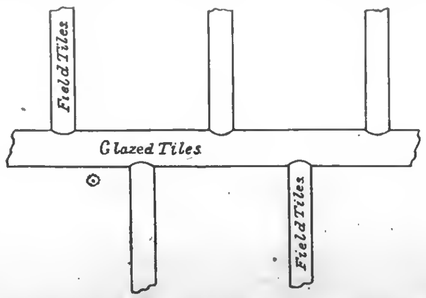
Assuming, however, that all the materials are carried to a common recepacle or tank at the end of the house sewer, there will be deposited daily 8,000 grains of organic matter, whether suspended or in solutions, and 12,000 grains of mineral matter or altogether some 3 lb., of which two-fifths is organic, or is, capable of undergoing decomposition, most of which will gradually be carried away when dissolved in the 200 gallons of water daily passing into the receptacle, the balance of carbon gradually being deposited in the tank. Of the mineral matter 50 parts are

* Paper read at the annual meeting of the Ontario Association of Architects, Toronto, January, 1902

in solution as potash, lime and other salts, which will likewise be carried away in the water. It thus appears that some 100 grains of insoluble mineral matter will deposit in the tank daily with small amounts of carbon, or in 365 days for such a household not more than 10 lbs. of mineral matters will have accumulated. That such is true may readily be proved by anyone caring to make the experiment, as I have done, that such a tank at the end of a year has not had a total deposit of solid matter, greater than can be held by a half-bushel measure. If the balance then, after decomposition, is capable of being carried along with the 200 gallons of water daily, it is clear that nearly all of it is capable, like any other soluble material, of soaking away into the soil with the water, if the conditions are favorable.



I have had drawn up for your inspection the diagram of a tank, which is intended to deal with such materials in a way to give the organic matter an opportunity to decompose, the water carrying the soluble materials, being gradually removed from the decomposing tank, which we may call the septic tank—the word septic meaning putrid or decomposing—to a second tank, whence it may be discharged by a simple apparatus, at such intervals as may be found practical to produce the best results. The question then arises: In what manner can we dispose of this organic matter in solution, conveniently and in such a way as will not create a surface nuisance, or a pollution of ground water? Let us assume that by a series of sub-surface tiles, laid in a proper manner, we can distribute the 200 gallons over an equal number of feet of surface. It is plain that each square foot would receive 1 gallon of water daily. As soils vary in their capacity for water, from a coarse sand which will hold in its interstices not more than 25 per cent. of its volume of water, to a tenacious clay which holds 75 per cent. of its own volume of water, it is apparent that if one gallon of water were poured on the surface of a cubic foot of dry soil, there would not be any water leaking away from the bottom of even a coarse sand, since a cubic foot of water equals 6.25 gallons; so that it requires 1½ gallons to be poured on such foot of dry sand before it begins to drain away from the bottom. A dry clay would hold three times as much before it began to leak. In practice it will be seen that two four-inch tiles, laid side by side, would distribute such water fairly well over the surface of a cubic foot of earth; and also that the water contained in them soaking out of the open joints and pores of the tiles would rapidly dispose of the small amount of water received by each tile daily. In practice it is found that in any ordinary porous sandy soil or sandy loam, tiles filled twice daily will rapidly dispose of the charge of soluble sewage poured into them; and, lifting up tiles after several years' use, I have found them lined



only with a fine stain of black carbon, the volume of the tile not being materially lessened. I have further found that even heavy clay soils with an occasional underdrain have been quite adequate to dispose of the amount of sewage poured into them from an institution of 125 inmates.

It may be proper now to briefly describe the method of construction of such a system of tanks and sub-surface tiles. As in any system of house sewage, it is convenient to arrange all the fixtures so as to discharge into one soil pipe. These being brought out beneath the ground-floor through the foundation, or, if the house be on a hill-side, it may occasionally be possible to bring them out under the cellar floor so that the wash-tubs there may be discharged into them, if this unsanitary plan for the laundry be adopted, the soil-pipe will be led to the top of a tank made of brick and cement in a manner similar to that shown in the diagram. If most convenient, this tank may be built directly against the house to save iron pipe and to prevent its appearance on the lawn, since, as will be seen in a moment, it is necessary that the discharge pipe of the tank on level ground be not more than a foot beneath the surface. The capacity of this tank n the case we are discussing will be such as to hold in each compartment 100 gallons, to be discharged twice daily. It will be seen therefore, that a compartment 2 x 3 x 3 feet will nicely hold 100 gallons, or a tank of interior measurement 4 feet long by 3 wide and and 3 deep is adequate for two compartments each holding 100 gallons.

The arrangement of the interior of the tank is shown in the diagram. As in all sewage tanks, the plan is adopted of having several divisions, the sewage becoming less dense as it passes from one to the other, thereby aiding to make that discharged from the valve chamber as thoroughly liquid as possible.

It will be seen that from compartment No. 1 to No. 2 the fluids are drawn off by an overflow pipe from about midway beneath the surface since at the bottom will be found sediment, while the whole surface is covered with the decomposing matter, which appears to the eye a solid mass, but is really the organic material kept floating by the contained gases of decomposition. The liquids, which pass over of course contain a large amount of organic matter in solution, being composed especially of ammonia (NH^3) and carbonic acid (CO_2) combined as ammonium carbonate with the sulphur compounds as ammonium sulphide. These are held in the second compartment until 100 gallons have accumulated, at which moment the flush valve operates automatically and discharges in a minute or two the contents of the tank into the sub-surface tiles. It is apparent that the size of the tanks may be made such as to deal with 1,000 gallons quite as readily as with a 100.

The sewage thus discharged must, it is evident, be carried to tiles so laid that each tile will get its own share of sewage and no more. It is apparent that with a rapid discharge, the tiles laid on an exact level will each receive this amount, if together they hold exactly 100 gallons, provided the air which is in them be displaced. It is found in practice that in a loose soil the air from tiles laid near the surface readily gives place to the water, if discharged under the head in the tank. Where the soil is level, as of a lawn or garden, it is apparent that the matter is a simple one. If on a slope it is equally apparent that some careful detail work will be necessary in order that the tiles may, at the same time, be kept at the same depth beneath the surface and also receive each its own share of sewage. To complete the description of the tank it is apparent that as some gases, in excess of what are in solution, may be given off into the space over the sewage, it will be necessary to prevent them from accumulating and forcing themselves through the cover of the tank. This is obtained by making the cover of rough boards, and if thought proper, they may again be covered with earth and sod. The gases, if any pass outward, will be absorbed by the soil. In addition to this however, it is necessary to provide for the ventilation of the tank. This is done by a large goose-neck leading from the distal end of the tank, which admits cold fresh air and thus will displace the warm gases of decomposition which are carried up through the soil-pipe to be discharged above the roof as in ordinary house-plumbing in cities where the separate sewerage system is in operation. It may be asked, what ultimately becomes of the organic matter carried away in solution. In reply I would say that through the action of the microbes of the soil the ammonia salts are rapidly nitrified—that is, are changed into nitrates or nitric acid, which at once combines with the lime and potash salts of the soil and thus has become a neutral salt in a condition to act as plant food for the grass or vegetables growing above it.

The following table by W. D. Scott Moncreiff, from the Ashstead experiments, 1895, illustrates the change:—

Effluent from cultivation tank.

Chlorine	Free. N. NH^3	Oxygen consumed	Nitric Nitrogen	Total Oxidized N	Total N of all kinds
9.0	12.5	10.3	9.843	0.12	0.12	12.46
From final filter tray after complete nitrification.					
7.5	0.25	0.2	0.58	9.0	9.0	0.6

As the tank arrangement from which these experiments are taken, was essentially a tank of this kind, except that, instead of the microbes of the earth to do the work Moncreiff had arranged a series of artificial filters or pieces of coke over which the sewage from the septic tank flowed, by which means the liquids for analysis could be obtained, there is nothing different in principle to the system we are discussing.

Little more need be said, I think, to make it clear that in these results of the study of biological processes, which convert organic matter back to its original constituents, we have not only a practical lesson of how to apply science to our every day needs and convenience, but we may also see how economical is Nature and how wholly wise in her operations if she does not have man attempting in his ignorance to violate some of her primary laws. To me it daily seems more true, the more that I try to comprehend the meaning of the processes of Nature in this fine old world of ours.

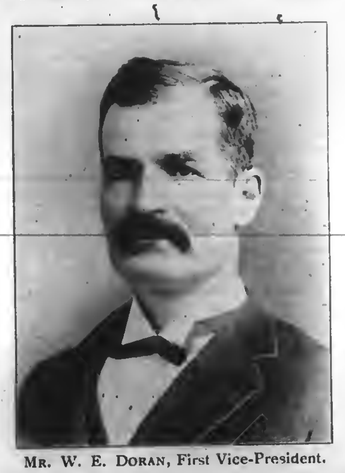
"That nothing walks with aimless feet,
That not one life shall be destroyed,
Or cast as rubbish to the void
When God hath made the pile complete."

PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS.

The eleventh annual meeting of the above Association was held in the rooms of the Quebec Section, City Hall, Quebec, on January 23rd, the President, Mr. G. E. Tanguay, in the chair. Those present were

Mr. Joseph Venne, President.

Messrs. G. E. Tanguay, J. E. Larochelle,, Thomas Raymond, E. B. Stavely, J. P. Ouellet. F. X. Berlinguet, Charles Baillairge, W. D. Baillairge, J. P. E. Dussault, R. P. Lemay, H. Staveley, and J. H. Lebon, from Quebec; Jos. Venne, G. A. Monette, J. S. Archibald, Jos. Perrault, D. Brown, J. Z. Resther, Jos. Sayer, Eric Mann, A. Raza, Prof. S.



Mr. W. E. Doran, First Vice-President.

H. Capper, R. Lacroix, Chas. Bernier, M. Perrault, J. E. Huot, A. T. Taylor, Alfred Venne, A. A. Cox, L. A. Amos and Simon Lesage, from Montreal.

The Treasurer's report showed that from the 31st of August, 1900, to 31st December, 1901, the receipts were $2,581.54, which, together with the balance on hand at 30th August of $514.40, totalled the sum of $3,095.94. The expenses were $1,515.54, thus leaving a balance on hand of $1,580.40.

The report which was submitted is a lengthy one and deals with the various subjects of importance to architects in a lucid and effective manner.

In regard to the tariff, the Council accepted an offer by Mr. M. Perrault, M.P.P., to bring the schedule of charges, as accepted by the Association, before the Lieutenant-Governor-in-Council.

Mr. Perrault did not succeed in obtaining the Lieutenant-Governor's assent to this schedule; and, on behalf of the Association, accepted important modifications thereof. As thus modified, the schedule of charges was approved and signed on March 6th, 1901.

During the year legal proceedings were taken against

Mr. R. P. Lemay, Second Vice-President.

eleven individuals, who were practising as architects without being members of the Association. In one case these proceedings are still pending; in every other case a satisfactory settlement was ultimately obtained.

This year the Quebec architects had the opportunity of employing for the benefit of the Association their influence with the members of the Quebec Government, in order to have the tariff made law; and working in conjunction with Mr. M. Perrault, architect and M. P. P., they succeeded.

The Quebec section has this year started the organi-

Mr. J. S. Archibald, Treasurer.

zation of a library of architectural books. The first works bought were those recommended to students for matriculation; said books are in the hands of the secretary at the disposition of the Quebec students.

It has been decided to buy each year a certain number of works on architecture, which will be the property of the Quebec section.

The following officers were elected :

Presiden.—Mr. Joseph Venne, Montreal.
First Vice-President—W. E. Doran, Montreal.
Second Vice-President—R. P. Lemay, Quebec.
Secretary—Prof. S. H. Capper, Montreal.
Treasurer—Mr. J. S. Archibald, Montreal.
Councillors—Mr. C. E. Tanguay, Quebec ; A. Raza,

PROF. S. H. CAPPER, Secretary.

A. C. Hutchison, A A. Cox, D. R. Brown, S. Lesage, Montreal.

DESIGN AS AN ELEMENT OF PRACTICE.*

BY PROFESSOR LAIRD, University of Pennsylvania, Philadelphia, Pa.

Good old Sir John Evelyn, in presenting to the world his "Parallel of the Antient Architecture with the Modern" delivers himself of these thoughts in addressing the reader :

"Before I do altogether resign this *Book* to thy Judgment, I advertise thee, that 'twas not my design in compiling it to teach any man." ***"I expect that men should presently say of me.***That I teach nothing particular and extraordinary here ; that the *Books* from whence I have gather'd all that I say being common and much ampler than mine, there was no need to have scummed them thus superficially over ; That it had been better to have search'd and produc'd something which the World had not yet seen.***But we shall not appeal to such Arbiters as these.****"Poor Men that they are, to believe that in fantastically Designing some one kind of particular *Cornice* or like Member, they are presently the *Inventors* of a new order.***As for those others to whom Nature has been more propitious, who are indu'd with a clearer Imagination, they very well perceive that the true and essential Beauty of *Architecture* consists not simply in the minute separation of every Member *apart* ; but does rather principally result from the *Symmetry* and *Oeconomy* of the *whole* which is the Union and Concourse of them all together, producing as it were a visible Harmony and Content."

Evelyn's ardent contention that the works of the ancients were worthy of the most reverent study and even literal reproduction, and his lofty contempt for those who ignored them and sought unrestrained novelty, showed that the conflict between progress and precedent was in full force on the eve of the great fire of London. And the splendid work that followed that event offers full evidence, not that precedent triumphed, but that the architectural impulse of a people grows with noble vigor into a splendid fruition when planted in a soil of unrest and aspiration, of vital interest in new problems and reverent study of old achievements.

Let me adopt this author's defence as my own. Far be it from my intention to teach or to offer from the book of experience any new thing, for its precepts have been well scanned and its lessons well learned by my audience. Yet even Evelyn's imagined critics would have conceded that the best known truths take a new force when reaffirmed, and I shall therefore venture to ask your attention to some of the more evident principles of our professional work in the hope that they may be acceptably reiterated and profitably discussed.

That Truth is the basis of all that is good in Art is but another way of affirming the breadth of principle upon which our own art is based, for the best architecture has always been an exponent of truth. And the best architecture has always expressed as its highest purpose the aim to build nobly : with the extreme of pleasure to the eye and the mind, with the utmost of stability and with the fullest adaptation of means to the end. All great buildings realize these conditions and are noble because of this fact. The same impulse and motive inspired them, whether the mind that produced them was that of priest or painter, sculptor or scholar, the impulse to build what should be more than mere building, to enrich and decorate in a way that should mean more than ornament alone, to surpass the simple utilitarian demands of the undertaking ; in other words to fuse these elements into a thing greater than their sum, nobler than their aggregate ; the highest aspiration of man's creative power—a perfect building !

In no two periods of Architectural history have the conditions been identical under which architects have worked and until modern times, indeed, the authors of buildings have not been known as architects in the sense in which we use that term. But in all ages and under whatever conditions, great architecture has been in evidence, and it should and can be no less so in this age.

Our situation as architects is unlike any that has preceded our time. We are devoted intensely and exclusively to Architecture as an occupation. We are consciously a class, standing before the world a group of men with a definite purpose and judged by high standards which we have ourselves proclaimed. The commercial and industrial development which has distinguished this age has brought into full flower the organizing of human effort and, with it, the systematizing and subdividing of human labor. Distinctions are sharply drawn between its various lines, and specialization has been forced into all fields. The architect has thus evolved as a necessary factor in modern life, emerging from those ranks which in the past were variously made up either of the scholar who indulged in Architecture as an elegant pastime, the painter or sculptor who regarded it as an allied province ; the engineer, the art craftsman and the studious artizan. Any of these and all have been architects at one time or another but today the architect is none of them. He must combine the offices of artist, constructor and man of business. The range of his responsibilities covers æsthetics, engineering and finance. His obligation to his client, whatever the actual magnitude of his commission, is usually one of greater pecuniary importance than that client entrusts to any other professional man. Upon the soundness of his judgment depends the security of life of multitudes who use his buildings. Of him is required artistic performance of the highest order in the greatest of the fine arts, whose product is always on view, and universal and continuous in its influence. He is successful in his professional career only as he meets the exacting demands of these dissimilar functions, either of which might be regarded as a distinct vocation. It might well be questioned if any human being—much less every member of an entire class—could meet such demands by finding in his person the required mental and temperamental qualities. Unquestionably No! But that architects do successfully meet them is proven in numberless cases, where the requisite mind and temperament are associated in congenial companionship and effective co-operation.

The conditions which have so enlarged and complicated the practice of architecture have also rendered success possible. The commonplace that "we are the heirs of all the ages" is nowhere so true as in our own profession. The lessons and resources of history lie at our fingers' ends and all Europe at our doors. Scientific spirit and industrial development have unearthed and classified one and brought the other. Highly organized systems of technical education are available for our preparation for life work, and to aid in that work the services of specialists of every description abound on every hand. The age is that of the card index with everything in stock, duly labeled, ready at hand for immediate and effective use.

But in all this marvel of development and organization, of the multiplication of resources and the simplifying of labor, one everlasting truth shines with undimmed brilliance. There must be a

* Paper read at the annual meeting of the Ontario Association of Architects, Toronto, January, 1902.

master mind, a single dominating influence, a subordination of all functions to a dominating purpose. Creative work of any kind demands this; particularly is it true in the Fine Arts and notably so in Architecture. And in this the controlling influence must be that of Art,—not science or business enterprise, for if it be either of these the result is barren engineering or mere building for the sake of money-getting.

We must understand Art, however, as meaning vastly more than appears at first view. Broadly speaking it should mean the entire creative side of our work as opposed to the executive. In this sense it comprises all those processes of study or preparation through which the final result is reached and which are supplemented by the actual execution of the work. I do not mean that every part of this study can be regarded as artistic in itself, but that in the performance of every part the controlling motive should always be a desire to contribute toward the perfection of the whole as a work of architecture. We are too prone to think that parts of our work can be divorced and carried on independently—that some parts are non-architectural and hence can be treated in a spirit entirely foreign to that of architecture. No greater mistake could be made, for nothing so much operates against the improvement of the art of building as the notion that architecture is a detachable part of it.

Design proper, in its broadest sense, is the assembling of materials in such a manner as produce structure at once stable, appropriate and beautiful. This means that a well-designed building is one in which the plan is well composed, the resultant building well proportioned and appropriately ornamented, the structural parts well adjusted to the work each is to do and the completed building properly adapted to its uses. To effect a consistent result it is necessary that all phases of the work of design be carried forward in a sympathetic relation. The scope and limitations of each should be recognized in manipulating the others, that none transgress and prevent proper exercise to each in its own field. Let us give some detailed consideration to the several features of Design in this broader sense. Inasmuch as the artist must give initiative to the work, it is proper to look at the question first from the viewpoint of composition or design in its more academic sense. Here we must attack first the broadest aspect of the problem, leaving minor considerations to subsequent study. The general nature of the problem must be studied—the essential purpose of the proposed building, the demands of its occupants and the limitations of its site, cost and materials of construction. Once these salient points are clearly understood, the study of plan must begin by a grouping and arrangement of its greater divisions, a search for the *parti*, for that general disposition which will permit the most direct and simple, economical and convenient grouping of the parts. This is often, perhaps always, the most clearly obvious arrangemeot when once discovered, yet, like other useful inventions, often the most difficult of discovery.

The plan now has attained its general character and this should be regarded as fixed. The major parts of the building are found to be properly proportioned to their uses and have the most convenient relation to each other. The thoroughfare system is logical and ample. Constructional economy has been rendered possible by directness of vertical supports, the delimiting of span, the simplifying of main lines for the mechanical systems. The artistic character of the building, in the praportions of its masses, is assured of a fair prospect of certainty by the mass proportions of the plan. And the further development of the scheme in respect of its practical requirements is assured of success for if the demands of the problem are clearly stated and realized in a broad, simple direct manner in the *parti*, the detailed requirements will fall naturally into place. The plan at this stage is however quite elastic and capable of much minor modification.

During the progress of this study the elevations have been kept generally in mind and the building has assumed a more or less clearly defined general character. These may now become the object of as direct study as has been the plan. The elevations follow close upon the plan in order that they may be governed by and give expression to its fundamental character. But this must be done judiciously with full regard to proportion and scale, relation of parts to each other and the whole, and the effect of line, color and light and shade. For this purpose there must be a certain independence of action ; a freedom from the restraints of a plan whose lines have been too far fixed ; too fully crystallized. This is possible if the treatment of the exterior is preceded only by the determination of the *general* character of the plan. From that point both may well be carried on together, each being adjusted to the other while either is developed to its own natural and reasonable end.

The considerations which should control this phase of the work may be summarized as follows :

First, as to the practical uses of the building.

Distribution : the provision and disposition of the required areas.

Circulation : the development of the thoroughfare system.

Concentration : the grouping of parts, locating of thoroughfares and minimizing of space to effect economy of time and labor to the occupants of the building.

Construction : the simplifying of structural lines to effect economy of construction and installation of mechanical systems.

Second : as to the appearance of the building :—

Proportion : This must reveal itself as clearly in the plan divisions as those of the exterior. For the plan may be made as expressive of the beauties of composition as the elevation. The proportions of the building and of its component parts, as well as the inter relation of these parts, are indeed expressed by the plan in two of their three dimensions and by the elevation in but one, and although the latter completes and perfects the proportions, these may be predetermined and expressed, to a remarkable degree, by plan study. If this element does not exist in the plan it cannot be properly realized in the completed design, for good proportion is inherent in the whole mass of a building, not in any of its superficial aspects.

Expression : If the plan is as carefully studied with a view to proportion as is the exterior, the unity thus given to the whole will contribute toward, if it does not produce that vital quality known as expression—a portrayal of its principal constructive divisions ; the "outward and visible sign" of its inward and actual nature. I do not maintain that this expression should be a rigid and mathematical labeling of the internal subdivisions but that it should not only not contradict the plan but should portray its main groupings and their relative importance and significance in a manner that shall be readily grasped and understood by the observer.

So much for certain of the more theoretical considerations that affect design. Further questions arise which must be answered for each problem out of its own limiting conditions. Among these may be named : Choice of Style, Method of Construction, Nature of Materials and Limitations of Site.

In speaking of Choice of Style I shall not venture upon the troubled waters of that sea of controversy whose name is Precedent. It is a stormy waste, but its currents are well charted and its shores offer to every mariner a haven of refuge to his own liking. And it may be safe to say that if he uses a compass of plain common sense a safe course is reasonably assured to him. But otherwise not. On one hand the purist is in constant danger of misdirection and absurdity, for he will clothe the modern plan with the habiliments of Imperial Rome or of its Italian revival, or mask a frame of vertical pressures with the externals of resistance to lateral thrusts. Archæology is his god and all his buildings bend the knee to it,—for scarcely a joint in their frames escapes some adjustment to the demands of Precedent. But is the freebooter not even more dangerous, with his contempt of all that the purist holds dear, an attitude usually serving as an indifferent cloak to crass ignorance. He glories in his self-styled originality and always finds an audience to applaud its monstrous fruits. It is not difficult to excuse, although we may not approve, the purist, but who can forgive vaunting ignorance and self-confident vulgarity ?

But these extremes are happily as rare as they are extreme, and the search for the golden mean, for that course which shall carry forward into modern practice the lessons taught by the past, is the motive which is near the heart and inspires the best effort of the great body of our practitioners. And under widely different titles it is engaging the attention of the schools and the professional bodies, notably so in recent deliberations of the Architectural League of America.

I confidently affirm that we shall proceed to the solution of this problem as we frankly recognize and freely adopt on the one hand the heritage of the ages, whether it comes through the demonstration of great principles or the use of traditional forms themselves ; and on the other hand as we recognize the demands and limitations of modern conditions, of local environment, of the native building material and, above all,

of the intensely individual and unique nature of the work in hand at the moment.

When, therefore, the question of Choice of Style arises let it be answered on the basis of common sense,—for let us admit that it is bound to arise and must be faced. Let it first be decided which of the historic styles best adapts itself to the method of construction to be used and most happily expresses the purpose or uses of the building. This point is not to be determined by the success with which the pure historic form can be borrowed and applied without change, but through a careful study of its underlying principles, both constructive and æsthetic. If the style is worthy of study, it will be found to have developed consistently throughout; the essential character has grown out of constructive requirements; minor parts take form and proportion as a secondary result; ornament aids in the expression of the whole and is consistent with it in general character and feeling. In short a certain spirit permeates the whole and this must be understood and felt before it can be properly imparted to new work. Obviously the most successful work in modern times is neither that which is most archæological on the one hand nor most free from suggestion of precedent on the other, but that to which the inherent character or spirit of past work has been imparted. And this, the highest level of achievement, is one in which the individuality of the artist most clearly reveals itself and in which that quality of fine architecture most distinctly comes into evidence, which we feel but cannot define,—the quality of distinctive individual character; the most admirable species of "Style"; infinitely to be preferred over pure historic style, however correctly this may be transposed from howsoever beautiful an original.

Methods of Construction, as the second of our limiting conditions, cannot be accorded the place they occupied as controlling factors in design when they comprised only the arch or the stone or wood lintel. The ancient necessity of using one or the other gave a simplicity and directness of force to the development of the several historic styles that is perhaps the reason of their inherent vigor and vitality. In our own time, when anything can be constructed of steel, however novel or difficult it may be, and when, as a rule, the great majority of buildings can be best built of forms which it seems most difficult to treat frankly and artistically, the temptation is great to treat structure and surface as independent of one another and as irreconcilable in their very nature. But this is not inherently true of any class of buildings and not true at all of some. We are in a transitional period and have only begun to grapple with the problem of how to treat the steel skeleton architecturally. Some progress has been made by the French, but this is in the use of the metal as both constructive and decorative material, so admirably managed in the Palais des Beaux Arts at the last Exposition. The problem of combining steel for construction and masonry for protection into a whole which shall give architectural recognition to both is as yet unsolved. But we of the new world are to do it.

Our next consideration, however, that of Materials, brings us face to face with conditions about which there is little of theory and much of plain duty. For here we may not take what we choose, but must choose the most suitable of that which is offered. This often seems unattractive or repellant, or at the best ill adapted to a proper color scheme or surface texture. But is this not often because local material will not so well adapt itself to a favored scheme of design? And is it not wise to consider this element with those of construction and plan as the factors which should dominate the manner or style of treatment? Surely no architecture has greater charm than that which seems indigenous, and of the very nature of its surroundings; a thing which could not have been produced elsewhere. This character is imparted most effectively by a judicious and tasteful use of native materials, whose color and texture as well as whose structural properties are carefully studied and intelligently employed.

Other considerations, such as unpromising peculiarities of site, and the restrictions of building laws and ordinances, make imperative demands upon the patience and judgment of the designer, but, from apparent obstacles may be turned to advantage under courageous attack. This is, of course, beside the question of accessories and surroundings from whose character and effect the building should never be separately considered.

This summary, while far from complete and greatly imperfect, yet presents some of the essentials of good architecture as it can and should be realized in our current practice. It is not doubted that difficulties beset the path of him who follows truth as the first principle of practice; who determines that his work shall be thoroughly and consistently designed in every respect. This path is not an easy one to travel but its pursuit means, to the individual architect, a growth of creative power and the maintenance of professional self respect, while to the profession it means whatever of progress may be made toward better quality of work, higher ethical standards and the elevating of the whole state of Architecture.

These are generalities, to be sure, and they glitter, be it frankly admitted, after the manner of their fascinating kind. One may reasonably protest that it is easy to theorize and to dream of a millenium but that we are confronted with stern and hostile realities; that one would willingly enough do better work if allowed the means with which to do it, but that clients are, as a rule, either unable to pay for what they want or are possessed of whims and prejudices equally fantastic and obstinate. There is no denying the force of this plea; these conditions are very real and very general and must be frankly faced.

Two remedies, however, present themselves with equal readiness, and both are based on education in its broadest sense. In the first place, to begin at home, we must train ourselves to absolute sincerity of attitude towards our work. There must be no mere striving for effect, no dragging in of artificial elements or suppression of those which have legitimate place. The nature of each problem must be carefully studied, its limitations recognized and its demands acknowleged. To reconcile these and work out the result in an architectural manner we must avail ourselves to the utmost degree of the means which lie at hand, and our materials must be studied with a view to their most effective use as regards construction, color, texture and possible ornament. The site and its environment must be accepted, not only as imposing difficulties upon the designer but as affording him a possible aid of the greatest value, if its own peculiar character be seized and echoed in his design. Other limitations, of whatever character, should be met and recognized in the general treatment of the problem. This does not imply a sacrifice of essentials, for if the artist be permitted, by his client, to make the best use of his materials the result may be entirely successful whatever the apparent paucity and barrenness of those materials. It may embody the best of qualities,—proportion and scale, excellence in mass and line, refinement and virility, appropriateness of ornament of whatever simplicity, and harmony of color. Above all, permeating the design, may be the evidence of good taste and the expression of individual character. Costliness is not essential to this result, but freedom is.

And at this point the education of the client is suggested. For our esteemed patron, as a rule, notwithstanding his virtues—perhaps indeed because of their very excess—is too little aware of our abilities and too prone to supplement them with his assistance, particularly in the field of Design. His control at certain stages of the work, and his cooperation at others, is indespensable, for he must pay for and use the building and his is the greatest loss if it prove a misfit. But if the structure be unsightly the loss is the architect's and once the practical requirements of the client are clearly understood and their attainment assured, the architect must be left free to grapple with the problem of design unhampered by the suggestions or mandates of the layman—that is, if the result is to be successful in the widest sense. Where a patron is a person of actual taste in these matters his cooperation with the artist is both a delight and an inspiration; but such a person instinctively recognizes the necessity of which I speak and prefers to leave the initiative with his architect.

The protest is entered against that spirit which so often shows itself in the attitude of clients who, while ready enough to entrust their architects with the difficulties of construction, are convinced that "all men are born free and equal" in matters of taste and that architects are engaged to carry out the pet fancies of the man who pays the fee.

The only effective means of changing this spirit lies in the power of the architect, both to do what is right and to persuade others that it is right. And this he cannot do if he be not himself convinced of the right. His convictions must be rooted in a sound training and the habit of study; must be nurtured by sincerity toward his art and be reinforced by a rational and open minded attitude toward its limitations. With these weapons some headway can be made against the worst case of obstinacy and domineering bad taste with which he is likely to deal and there are few laymen who will not feel and respect in an architect the force of deep and intelligent conviction, and who will not yield to it to a greater or less degree.

In this quality is found the most effective means of educating the client, and through him the public, and by this road lies the constant advancement of professional standards and the steady uplifting of architecture, whether it be as an art or a profession, or blending of both.

In this sense, then, is design an element of practice, that, broadly conceived, it underlies all that is of real and lasting excellence in the work of the architect.

THE IMPROVEMENT OF THE GROUNDS OF THE TORONTO INDUSTRIAL EXHIBITION.

When it was proposed last year to erect three new buildings on these grounds, one of them being of much greater area than any of those now in existence, it was felt by the members of the Toronto Chapter of the Ontario Association of Architects that the time was opportune for a re-arrangement and improvement of the avenues and grounds as far as circumstances permitted.

The development of a satisfactory scheme, and its adoption before the location and commencement of the new buildings, was considered to be a matter of paramount importance, as, one placed in a wrong position, changes or improvements would be permanently blocked or delayed for many years.

The Chapter spent many evenings in working out suggestions for these improvements, several members submitting sketches.

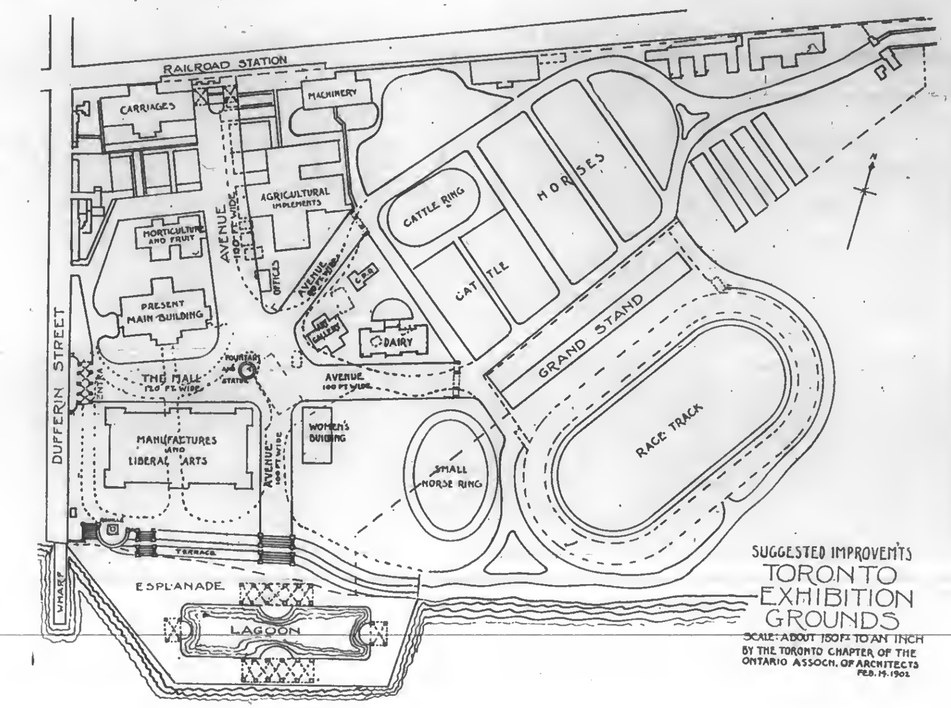
The good points of the various schemes were assimilated into the plan which was most favorably received, and although it was not felt that this plan was at all perfect, especially as the Chapter was in ignorance of some of the requirements, it was submitted to the Exhibition Board which passed it on to the Parks & Gardens Committee of the City Council.

instance as nearly as possible on the old walks and roads, which are indicated by dotted lines.

The making of the new avenues and the widening of the old may be spread over a series of years if necessary, and no large buildings, except those referred to, need be removed till they are worn out or obsolete.

The scheme, in brief, is as follows:—

The main avenue or mall 120 ft. wide to be located south of the present main building with appropriate entrance gateways on Dufferin street. The mall to open into a circle 300 ft. in diameter from which will branch avenues leading north, south and east 100 ft. wide, and north-east 80 ft. in width. The triangle between these avenues would be occupied by the art Gallery and the Dairy Building, while the Manufacturers and Liberal Arts Building would be located on the south side of the extension of the mall leading to the grand stand, and just west of the small horse ring, and not immediately south of the present main building as shown in the cut. This will permit the main avenue running north and south to be extended in a direct line to the lake. All these avenues to have their axis radiating from the centre of the circle, which would be their focal point, after the manner of the avenues in Washington, which are admitted to be among the finest and best planned on this continent.



Since the revival, with the new year, of the project of erecting the new buildings, a committee of the Chapter, in consultation with members of the Exhibition Board and the Park Commissioner, have evolved a modification of the former plan, eliminating the impracticable features and providing satisfactory sites for the proposed new structures.

It is not claimed for this plan that it is a complete or entirely satisfactory solution of the problem, as such is practically impossible under existing conditions, but it is claimed that it will be an immense step in advance of the present lay out of the grounds, and some approach toward the type of grounds so well illustrated in the planning of the Pan American at Buffalo.

The commendable features of the grounds at Buffalo were the broad Plazas, direct Avenues, well defined axis, interesting focal points, and well placed buildings.

Our scheme embodies these features as far as circumstances will premit.

The new buildings can be located in the positions shown with but little change, this year, in the roadways or approaches, while only one large building, (the Annex, or Women's Building) and three or four unimportant buildings will require removal.

It will be observed that the new avenues are located in every instance as nearly as possible on the old walks and roads, which are indicated by dotted lines.

It will be observed that the plan illustrating the above article does not correspond with the text. The location of the Manufacturers and Liberal Arts Building was changed after the engraving was prepared, and too late to alter it, as a result of a conference between the Park Commissioners, the architects of the building and the members of the Toronto Chapter, at this week's lunch.

The vistas at the ends of the avenues could be closed by appropriate architectural features such as a tower, arcade or pergola, while the circle could be accentuated by a generously proportioned fountain, embellished with groups of sculpture.

As the work of development went on year by year an esplanade could be formed at the mere expense of cribbing, the filling being done by the street commissioners department.

In this esplanade a lagoon or lagoons could be formed with appropriate architectural features on the margins.

If possession of the garrison commons should be acquired, the esplanade could be extended a long distance eastward, making a magnificent foreground or front to the grounds.

The banks along the shore, which are now but a disgraceful dumping ground for rubbish, could be terraced, with suitable balustrading and steps, making an unsurpassed vantage point for viewing aquatic displays in the lagoons beneath, or the lake beyond.

These suggestions are confessedly somewhat crude, and require working up into a systematic and well thought-out scheme.

This being done it should be quite practicable to do something each year, however little, towards the final completion of the scheme. The vital point is to secure and adopt a well devised plan now and adhere to it till the work is finished, be it ten or twenty years hence.

EDMUND BURKE,
Chairman of Chapter.

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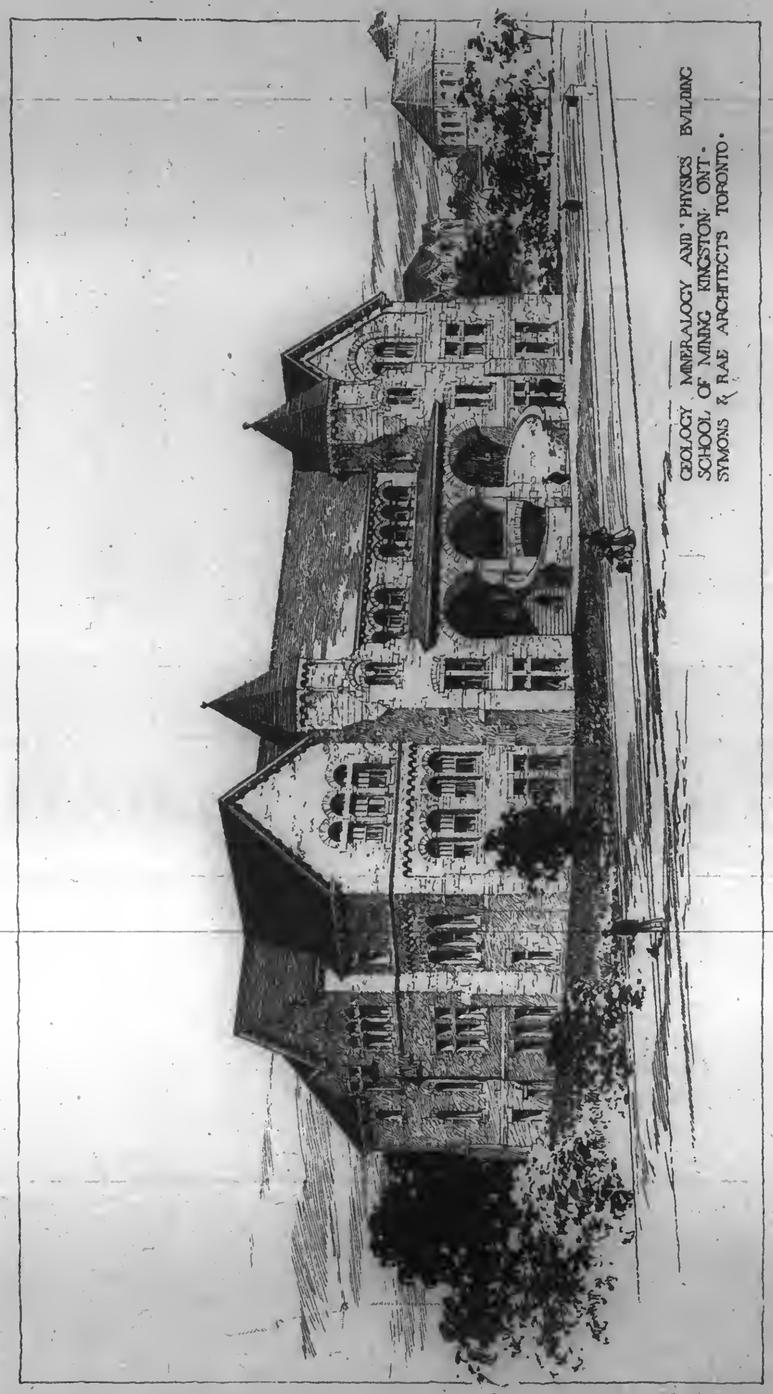

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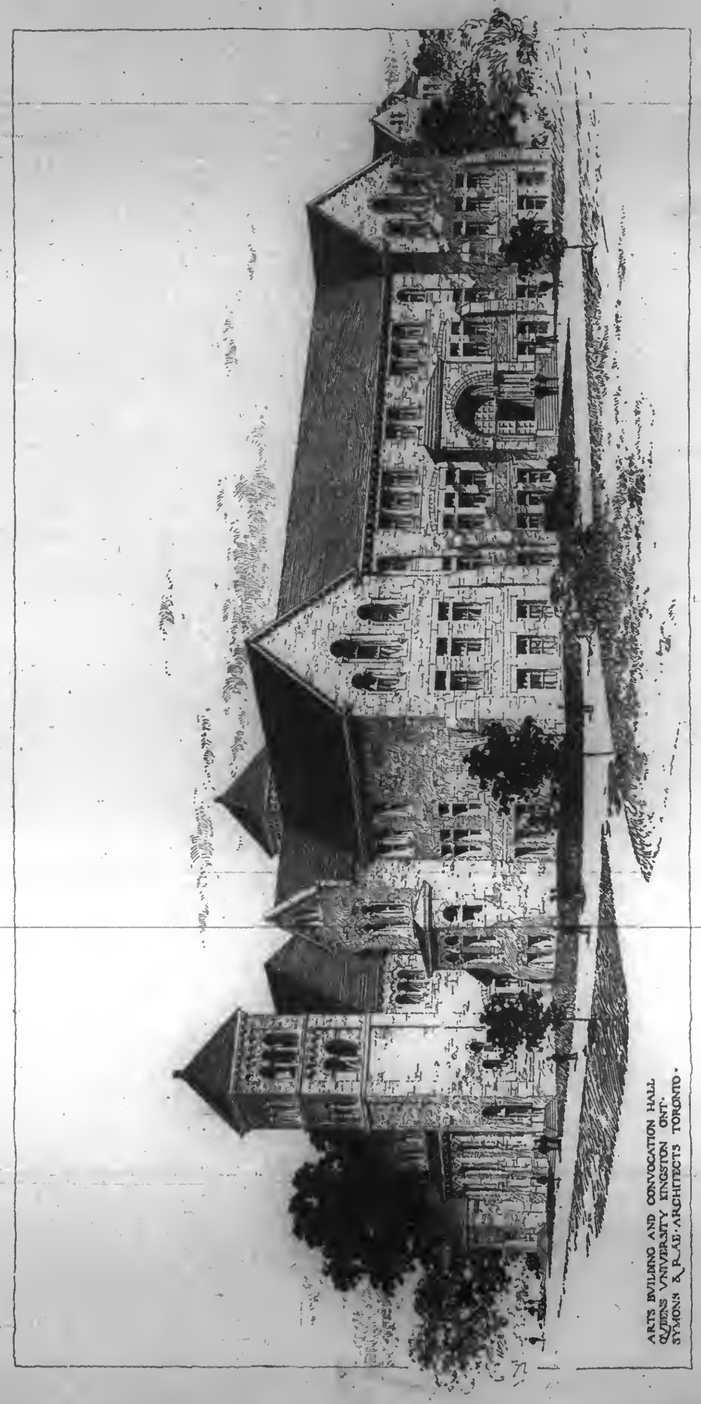
SYMONS & RAE ARCHITECTS TORONTO.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
FEBRUARY, 1902



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QUEENS UNIVERSITY KINGSTON ONT.
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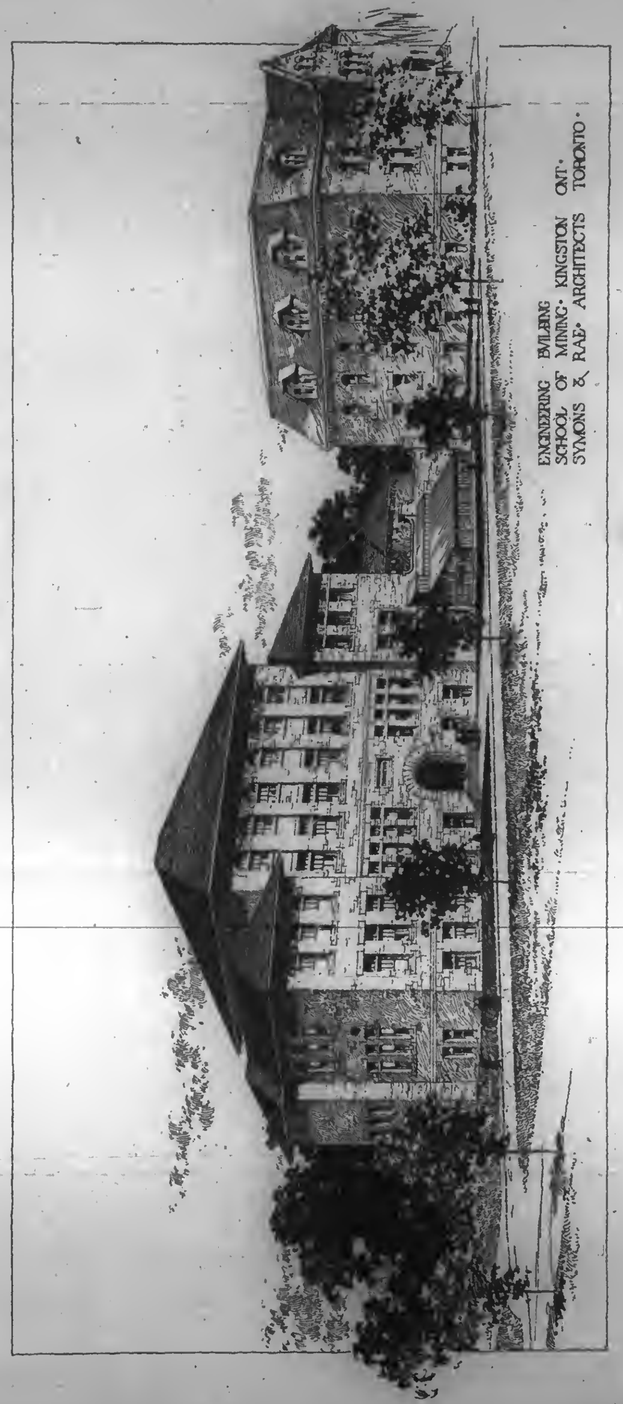
CANADIAN ARCHITECT AND BUILDER.



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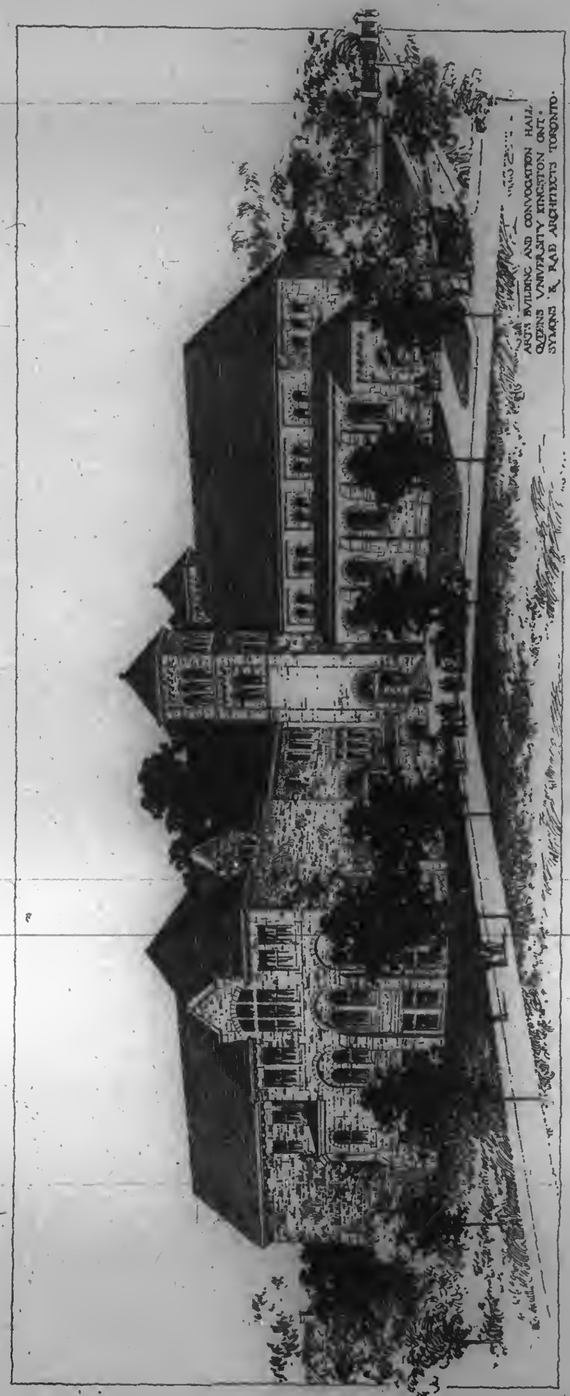
SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
FEBRUARY, 1902


ARTS BUILDING AND CONVOCATION HALL
QUEEN'S UNIVERSITY KINGSTON ONT.
STARKS & KAY ARCHITECTS TORONTO.

INTERIOR OF ENGLISH CATHEDRAL, MONTREAL.
JOHN WELLS, ARCHITECT.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER

ENGLISH CATHEDRAL, MONTREAL.
JOHN WELLS, ARCHITECT.

The Canadian Architect and Builder

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ILLUSTRATIONS ON SHEETS.

Accepted Design for Art Gallery to be erected on the Toronto Industrial Exhibition Grounds.—Beaumont Jarvis, architect.
Residence, South Drive, Rosedale, Toronto.—F. H. Herbert, architect.

ILLUSTRATIONS IN TEXT.

Free Hospital and Cottages in Connection with Sanitarium for Consumptives at Gravenhurst, Ont.
Canadian Building at the Wolverhampton Exhibition, Wolverhampton, England.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Photogravure Plate—Knole House—Chimney Piece in Ball Room.
Photogravure Plate—Blickling Hall—Principal Staircase.

CONTENTS

Editorial	33-34	Loads on Foundations	44
Principle and Method	35	An Invention for Determining the Hardness of Woods	44
British, Canadian and United States Architecture	36	Ancient Methods of Flooring	44
Intercommunication	37	Building Legends and Curiosities	44
Tests of Douglas Fir	38	Fire-Proofing Materials and Methods	45
Curious Ceilings	38	The Park Avenue Hotel Fire	45
Accidents on Buildings	38	Apportioning the Cost of Permanent Pavements	47
Tests of Strength of Hollow Building Blocks	39-40	By the Way	ix
Concrete Construction in Building	41	Students' Department	x
Blistering of Paint	42	Ancient Methods of Lifting Heavy Stones	xi
Building Wrecking	42	United States Competition	xii
Notes on Portland Cement Mortar	42	A Correction	xii
Treating Marble	43	Complimentary Dinner to Mr. D. B. Dick	xiii
	43		

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The Safety of Theatres.

Adverting again to this subject, to which some attention was given in our February issue, the important suggestion was recently made by a Mr. Mulholland in a paper read before the Playgoers Club of London, that a portion of the roof over the stage should be of glass, the breaking of which in the event of fire would draw off the smoke and flames from the auditorium. The advantage of this method of construction was proved in connection with a fire in the Grand Theatre, Islington. One of the greatest dangers to which an audience is exposed when a fire occurs in a theatre is from suffocation by smoke, hence the value of the above suggestion.

An Out-of-Date Building By-law.

The City Engineer of Johannesburg, South Africa, recently made request of the City Engineer of Toronto for copies of regulations governing the use of iron and steel in building construction. The City Engineer of Toronto in his reply was compelled to make the humiliating confession that the Toronto Building By-law makes no reference to or provision for this form of construction. It might with equal truth have been stated that the by-law is in a hundred other particulars twenty years behind the times, and that the only effort to bring it up-to-date was made, not by the City Council, but by an outside body, the Ontario Association of Architects, the result of whose labors in the form of a draft by-law submitted to the Council, was pigeonholed some eight or ten years ago, and has never been heard of since.

Shingling Brick and Stone Walls.

The walls of some new houses now under construction in Toronto will be covered with wood shingles down to the level of the first floor. The shingles are nailed to strips of wood inserted for the purpose in the joints of the brickwork. The architect has two purposes in view in using this method of construction—first by means of horizontal lines to reduce the apparent height of the buildings and secondly to secure warmth and dryness. As regards the first of these, he is of opinion that a fault in the design of most of our residential buildings is their too great height, largely due to the free use of vertical lines. The use of shingles on brick and stone walls as a means of protection from wind and rain, has long been common in some of the country districts of the province of Quebec, as well as throughout the provinces of New Brunswick and Nova Scotia. In Quebec the north and east sides only of dwellings are frequently protected in this manner. In some cases outside stone walls are plastered with cement without the use of furring, the cement being put on with a trowel.

Women Practising Architecture

The first paper ever presented by a woman before a society of British architects was read by Miss Ethel M. Charles at a recent meeting of the Architectural Association in London. The paper was entitled "A Plea for Women Practising Architecture." The author has taken the student's course and passed the examinations of the Royal Institute of British Architects. She cleverly marshalled arguments in support of her contention that women possess equally with men the essential qualifications necessary to success in the practice of architecture. She instanced the fact that women are employed in the heavy work of chain-making and in the harvest fields as a proof of their ability to withstand physical strain. While not admitting their inability to climb ladders, she suggested as a means of overcoming the possible objection to them being seen climbing ladders, that women architects should, like Christopher Wren, be hoisted up in a basket. The achievements of women in the universities even in such subjects as mathematics and logic, were cited as evidence of their mental ability to deal with matters of a scientific and practical nature. On the artistic side it was claimed that their natural qualifications are superior to those of men. It was contended that a practical training in the workshop has ceased to be a necessary part of the training of an architect, intellectual activity rather than manual skill being the sine qua non of success. The lack of creative power in women was admitted, but the increasing self-reliance of the sex gave foundation for the hope that this power, long dormant, might be roused into activity. In the discussion which followed the reading of the paper, most of the speakers doubted the ability of women to successfully perform all the duties of an architect, especially to deal with contractors. At the same time there was manifested a disposition to give them the opportunity to try. The adaptability of women for office work, for the planning of domestic buildings and for work of a decorative character was fully recognized.

The Beautifying of Cities.

THE movement for the beautifying of cities is rapidly extending. It is gratifying to note the remarks of Mr. A. E. Ames, President of the Toronto Board of Trade, on the necessity of a definite plan for the improvement of Toronto. Mr. Ames suggests the expenditure of a reasonable sum by the City Council to secure the services of a competent person to prepare a comprehensive plan for the beautifying of the city, this to be followed by the procuring of legislation authorising the appointment of a commission to adminster funds for carrying out the plan adopted. Mr. Ames is quite right in his opinion that such a plan would secure better results than the present method of sectional improvement. The Ontario Association of Architects has been asked to support a movement to have plans prepared by an expert for the beautifying of Toronto Island. A great improvement has been effected on the Island in recent years by the efforts of the City Commissioner and Park Commissioner, but these improvements would be greatly enhanced by the preparation of a definite and comprehensive scheme to the completion of which all future efforts should tend. Every scheme for the beautifying of cities should include the architecture of at least the principal thoroughfares, and especially buildings of a public character. An important step in this direction has just been taken in New York by the introduction of a bill, drafted by the New York Chapter of the American Institute of Architects, in the New York Legislature, providing that the Mayor of New York shall, before the 1st of June next, select from a list of 100 names, presented by the Fine Arts Federation, 50 architects who shall be declared to be "eligible architects for municipal work" and who shall carry out all architectural work undertaken by the city in the future. Provision is made for increasing the list to 100 names, after which vacancies will be filled only as they occur. The selection of architects for this list is not restricted to members of the profession resident in New York, but may include architects of standing in any part of the country.

Toronto Building By-law.

In June of last year some amendents were made to the Toronto Building Bylaws. The following section numbered 13a. was added to By-Law No. 2468 :

13a. As soon as all buildings in process of construction are up one storey high, and joists on, the said joists shall be covered or floored temporarily, or otherwise with inch boards, as each storey is built ; in cases where joists are over sixteen inches up to four feet centres, one and a half inch plank shall be used ; and where joists or beams are over four feet up to six feet centres, then two inch plank shall be used, or else two one-inch boards laid one on top of the other. In case of steel structures where the girders are twelve feet centres, two-inch plank shall be used with sufficient support in the centre."

The City Commissioner has recently notified the city contractors that compliance with this section of the By-Laws will be enforced, and that those who fail to comply with the provision will be summoned to the Courts. It will be noticed that the By-Law does not stipulate by whom the temporary floors are to be constructed. By request of the Builders' Exchange, the Toronto Chapter of the Ontario Association of Architects have appointed a committee to discuss with the builders in what way compliance with the By-Law should be made. It is clear that a temporary floor must be provided by someone. The question is whether the carpenter or bricklayer will put down the floor. The absence of a definite understanding on this point would, the builders claim, result in each of these contractors feeling under obligation to furnish the floor and charge the cost in his tender. The suggestion has been made that architects should in every case specify double floors. This is said to be the practice in the United States. We imagine, however, that architects would hesitate to saddle their clients with this extra expense, which, in the case of large buildings, would amount to a large item. Judging by the record of accidents in recent years, this amendment to the By-Laws does not seem to be necessary, and the results in the direction of increased safety to workmen are not likely to be commensurate with the trouble and expense involved. At the urgent request of the Trades and Labor Council, a city scaffold inspector was recently appointed, and it may be that this and other amendments are necessary to provide this official with employment. The amendment in question serves to illustrate the unwisdom of fragmentary changes of this character in the By-Laws. What is required is a careful revision of the regulations as a whole.

PRINCIPLE AND METHOD.

The paper on the Field of Decorative Art, printed on another page, and the discussion which followed the paper, suggest a great want in the literature of architecture. Book upon book has been written upon the historical development of architecture, but always regarding it as a historical document. The sequence of styles is perfectly established, but to whom is it of real use except to historians ! Architects value books on the subject chiefly for their illustrations, and use them, not for the purpose with which the book was written, but to help themselves in some way to design modern work. In other words every man, unconsciously or half unconsciously, makes for himself, according to his light, rules founded upon the principles of beauty, that is to say the causes of attractiveness, in the buildings he is studying, in order that he may bring into being, not the same design, which he knows to be impossible (if he is experienced), but the same attractiveness, and for the same reason, in his own work. It is needless to say how slow this process is and how ineffectual in many cases, where nevertheless the beauty of the building studied obtains full appreciation. A mind capable of conception is very often not strong in analysis. It wastes time and energy in feeling its way to the results. What is necessary to enable it to work rapidly and surely is a framework of principles and method supplied from without. This is the real use of the architecture of the past to the architects of the present—as architects; to supply models from which the causes of beauty may be deduced. It is only upon some such scientific basis of design that it is possible to invent with ease. No man can mass design by accident, and it is in massing that design really consists. As all design consists in this, all ages supply matter for its illustration. Yet how little has been said about it. We learn in works on architecture that the Greek pediment was low in pitch, that the Romans pitched their pediments higher and the Gothic designer's gable was highest of all ; but no lesson in design is drawn from this. We learn in every case merely what the designers of a period did ; and, so far as construction in design is conveyed at all, we are taught only how to carry out historical unity in design. Experience teaches that there is more in preserving historical unity than the mere avoidance of offence to the eye of the educated. We avoid also offence to the educated eye. A mixture of different historical characteristics is fatal to the harmony of design. Knowing this, but not knowing clearly what is essential and what is not, the wise man goes by his book ; and as he becomes skilled in the styles, comes, as all men do, to enjoy his skill, and love correctness for its own sake. That is to say from hatred of solecism he commits a wholesale solecism every time he builds.

This is not much to show for a faithful study of architecture. There must be more to be got out of it than that, the lesson of the history of architecture should be, not what the past designed, but how it was designed. The beauty of every great example has a reason. To return to the three classes of gables—there is reason, as shown by John Beverley Robinson, for the varying pitch. The Greek front, solid widely spread, is suitably finished with a low pitched gable, while the Roman, more slender and vertical, naturally cocks it up and the Gothic more again. This is the kind of truth we should learn from the history of architecture. To know how to be Greek or how to be Roman or Mediaeval is merely to put one's self in fetters. To know why all three were good is to give one's self the freedom of design in any age—even in our own.

Mr. H. G. Wells, who is so fond of carrying his scientific observations into the future, has, in his new book of "anticipations" about the state of the world in the year 2,000, some speculations about the conditions of building. He is of course heartlessly scientific and says, (I quote at second hand) that he expects the engineers of the future to be the great men of their time, but the architects to be opposed to progress, because they are "too highly cultured and not sufficiently educated." By "cultured" he evidently means trained in precedent, and by "educated" trained in science. Making allowances for his scientific point of view, and the probability that his idea of an architect's education is limited to a study of the properties of iron and concrete and sewage, the accusation, whether it is likely to be justified, or not, gives a judicious pointer as to the need of more scientific education for architects in the future ; an education which shall be scientific in all directions ; in design as well as in construction. The constructor has become inventive ; the designer must become inventive too. I am well aware of the horror of lean iron forms, and of the necessity of forming new ideas of beauty, that the idea of architectural invention brings before a well regulated mind. But surely to study the principles of design is the very way to prevent the realization of this horror. There cannot be more than one set of principles of beauty in this world, even if it is possible to conceive of there being another set in any other world. It looks therefore as if to take Mr. Well's advice and devote ourselves more to "education" and less to "culture" is the surest road to making beauty keep company with the necessity that is coming to us of keeping design abreast with construction in our own times.

But a new departure in design is not what this article is about. It is clear that principle and method are the only road to such a departure when it becomes necessary. Culture, in Mr. Wells sense, has already met a Waterloo in the tall buildings of New York. In their case, it is not until the dusk comes on, to obliterate

their architectural treatment, that a consciousness of their greatness is not obscured by a perception of their littleness. It must be possible to make more of such opportunities than that, and it is clear from the failure of the early efforts in this kind of building that Vitruvius is out of it this time. A study of the principles of design is particularly necessary for these problems which therefore bear essentially upon the argument; but the purpose of this article is to advocate the acquisition of familiarity with principles and facility in method for the purposes of ordinary design. All design requires it, the simple as well as the stylish; and the most affectionate adaptation of old work would be better done if the principles at the bottom of the original were open to the eye as well as the result.

Where then are these principles to be found that we may acquire them? That unfortunately is the difficulty in this matter. That is the want spoken of above, in the literature of architecture. They exist, there is enough evidence to show that. And the definition of many of them exists too, scattered here and there through the works of writers on art. Every architect has found out some for himself, and if he turns his attention particularly in that direction, will find out more. Gwilt enters into the elusive question of proportion. So does Viollet le Duc in his Lectures on Architecture. One can hardly come out of a study of these investigations without some serviceable addition to method in setting up a design. There are suggestions for practice to be gleaned from H. Heathcote Statham's Architecture for General Readers. But the most enlightening and serviceable attempt is that of John Beverley Robinson in his Principles of Architectural Composition; which he describes in his subtitle as "An attempt to order and phrase ideas which have hitherto been only felt by the instinctive taste of designers." With these books at hand. and particularly the last, we have not such a bad showing for our purpose after all. The books are all in the library of the Ontario Association of Architects.

The papers read before the Royal Institute of British Architects are very often concerned with principle and method, and a useful collection might be made from them of the opinions of practising architects upon these points. It would be even more useful if our own architectural associations devoted themselves to putting together their ideas in the form of papers upon this subject. An original paper of any kind blesses him that gives as well as him that takes. To set in order what he knows, or to classify and arrange what he can glean from books, or even to boil down John Beverley Robinson for his own personal use, is an exercise which would well repay the time expended upon it by an architect, and would be a useful contribution to the proceedings of his association.

No doubt something to this purpose can be gathered from Ruskin's architectural works; but, as the investigations of the Stones of Venice are directed towards the evidence of character in architecture as found in the detail, his principles are concerned more with conception and character in architecture and beauty in detail than with the composition of masses. In Ruskin's Elements of Drawing, the composition of landscape is considered and these rules are of course of general application—for any one who is capable of applying them.

It is this capability which we may expect to be the fruit of studying the principles of beauty in architectural composition and practising methods for their scientific application in design. The adoption of John Beverley Robinson's rules in something of the rule of of thumb manner will keep a man from being a fumbler; but, to be at home with the principles of beauty, and to have an instinct for method so as to compose with ease, one must look for these principles in all kinds of composition and study every method that holds out the hope of putting them together with some approach to geometrical certainty.

W. A. Langton.

BRITISH, CANADIAN AND UNITED STATES ARCHITECTURE.

An English architect who visited Toronto recently expressed appreciation of the merits of much of the domestic work under construction and recently completed in that city. In view of the proximity of Toronto to the United States, he was surprised to find the modern architecture based so largely on English instead of American lines. Even American architects, he thinks, are following, to some extent, British precedent, especially with regard to planning. In buildings of a public character, however, Americans are largely influenced by the traditions of the Beaux Arts School at Paris. They have sufficient invertiveness, however, to impart originality to the style, and to adapt it to the requirements of this Continent. In buildings of this class the English architect, as a rule, is less successful. This is believed to be due to the limited size of the sites and buildings with which he has principally to deal. Not only are the sites in most instances very limited in area, but very irregular, so that it is not possible to give to the buildings the bold treatment which is so characteristic of large buildings in the United States built on rectangular sites. Even the Germans, who have little to say in praise of English architectural design admit the skill displayed by English architects in planning. This skill is largely the result of the necessity of adapting buildings to irregular sites, while the regularity of the sites of the majority of large buildings in American cities renders planning of such structures comparatively easy. Another hindrance to broadness of effect in English street architecture is the fact that nearly all the land is leasehold. Leases belonging even to the same estate, expire at different periods, thus preventing the carrying out of any general scheme of improvement of the street frontage. Such improvements as may be made are usually arranged for when the lease of the land on which the building stands runs out. The improvement thus relates only to the individual building and uniformity of design and effect is not obtainable.

Mr. J. Wilson Gray, architect, has removed his offices from the 3rd to the 6th floor of the Confederation Life Building, Toronto.

Messrs. Burke & Horwood, architects, suffered heavy loss in books, drawings, etc., by the fire which partially destroyed the Union Loan Building, Toronto, on the morning of the 3rd. inst. Fortunately their drawings of current work had been placed in the vault, and thus escaped injury. Messrs. Burke & Horwood have temporarily removed their offices to No. 15 Toronto street. The Toronto Chapter of Architects, of which Mr. Burke is chairman, passed a resolution expressing the sympathy of that body with Messrs. Burke & Horwood in their misfortune.

INTERCOMMUNICATION.

[Communications sent to this department must be addres ed to the editor with the name and address of the sender-atta hed not necessarily for pub ication. The editor does not hold himself responsible for the expressions or opinions of corre pondents, but will, nevertheless, endeavor to secure c rrect replies to queries sent in. We do not guarantee answers to all queries, neither do we undertake to answer questions to issue following their appearance.]

From "Builder":—What is the rule for finding the length of braces between two posts when they incline one foot in six feet rise?

Ans.—Suppose the illustration, Flg. 1, represents a frame, the posts of which incline one foot in six feet

Fig. 1.—Getting Length of Braces.

rise. Let the distance B B represent a distance of seven feet. The braces are run at an angle of 45°. The posts inclining one foot in six leaves the distance at A A six feet. The length then may easily be found by using the steel-square which will also give the bevels of the joints. In this case the actual length of brace from point to heel is 8 ft 5 3-16 inches. The square may be applied 6 times, using 12" mark on the blade and 12½ inches on the tongue—then lay out, the same as laying out rafters.

From "A Village Contractor":—Will you please inform me of the method generally adopted for measuring masonry, both before and after being built?

Ans.—Stone masonry is measured by two systems, and they are again subject to local usage. These systems are called quarryman's and mason's measurements. By quarryman's measurements the actual contents are measured—that is, all openings are taken out and all corners are measured single. By mason's measurements corners and piers are doubled, and no allowance made for openings less than 3x5 feet, and only holf the amount of openings larger than 2x5 feet. Range work and cutwork are measured superficially, and in addition to wall measurement. Rough stone walls are measured by the cord of 100 feet in the wall, or 128 feet loose on the ground, and all openings less than 3x3 feet are counted solid, and half of openings above that size are counted as solid walls, to which must be added 18 inches running measure for each jamb built. Arches are counted solid from their spring. Corners of buildings are counted twice. Pillars less than three feet are counted on three sides as lineal, multiplied by fourth side and depth. It is customary to measure all foundations and dimension stone by the cubic foot, water tables, base courses and similar work by lineal feet. All sills, lintels, and ashler work by superficial feet, and no wall less than 18 inches thick. To lay a cord of stone of 128 feet loose will require three bushels of lime and a cubic yard (27 cubic feet) of sand, and when laid in wall the whole will measure 100 cubic feet, or one mason's cord.

Brickwork is generally measured by the 1,000 bricks laid in the wall. In consequence of the variation of size of bricks, no exact rule that will apply to all localities can be laid down. The following, however, is a fair average for Canada or Ontario at least, and is adopted generally by the Ontario Association of Architects:

For a	4¼	inch or veneered wall,		6½	inches
"	9	"	wall	13	"
"	14	"	"	20	"
"	18	"	"	26	"
"	22	"	"	32½	"
"	27	"	"	40	"

This rule may vary from one-half to one brick for each superficial foot in a wall, according to size of bricks, but not any more. If the bricks are large, the number per foot of wall may be one brick less than given in rule; if smaller, the number per foot may be increased by one foot or less. This rule is based on a standard size of 8¾ x 4¼ x 2⅛ inches. Corners are not measured twice as in stone-work. Openings over 2 feet square are deducted. Arches are counted from the spring. Fancy work counted 172 bricks for one. Pillars are measured on their face only.

A cubic yard of mortar requires one cubic yard of sand and nine bushels of lime, and will just fill thirty hods. One thousand new bricks closely stacked will require 56 cubic feet of space. One thousand old bricks cleaned and loosely packed occupy about 72 cubic feet. Five courses of bricks laid in a wall should make one foot in height of wall or chimney. Six bricks in a course will make a flue 4x12 inches, and eight bricks in a course will make a flue 8 inches wide and 16 inches long. Bricklayers generally contract for laying bricks by the 1000 in the wall, and the prices vary according to cost of materials and price of labor.

From "A Mechanic":—Will you please explain how the different "cuts" for mitres, octagons and hexagons, are obtained by the use of the steel square?

Ans.—Note the diagram, Fig. 2. Here we show a quarter of a circle x A C, along the horizontal line A B,

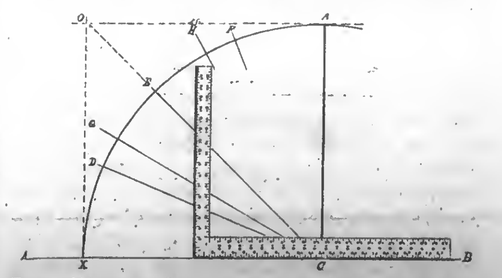
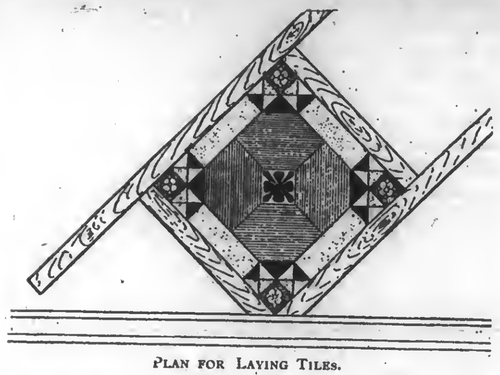


Fig 2.—Method of Obtaining Cuts for Mitres, for Square, Octagon and Hexagon, by Aid of the Steel Square.

the square is laid with 12" on the blade at the centre C, from which the quadrant was struck. If we divide this quadrant into halves we get the point E, and a line drawn from 12" on the blade of the square and through the point E, we cut the tongue of the square at 12" and through to O, and the line thus drawn makes an angle of 450, a true mitre. If we divide the quadrant between E and X, and then draw a line from C, a 12" on the blade

of square, cutting the dividing point D, we get the octagon cut which is the line C D. Again, if we divide the space between E and X into three equal parts, making G C one of these parts, and draw a line from C to G cutting the tongue of the square at 7″, we get a cut that will give us a mitre for a hexagon, therefore, we see from this, that if we set a steel square on any straight edge or straight line, with 12″ and 12″ on blade and tongue on the line or edge, we get a true mitre by marking along the edge of the blade ; for an octagon mitre, we set the blade on the line at 12″, and the tongue at 5″ and

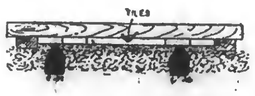


PLAN FOR LAYING TILES.

we get the angle on the line of blade—nearly—and for a hexagon cut, we place the blade at 12″ on the line, and the tongue at 7″, and the line of the blade gives the angle of cut—nearly. The actual figure for octagon is 4 31/32 but 5″ is close enough, and for a hexagon cut, the exact figures are 12″ and 6 15/16, but 12″ and 7″ is as near as most workmen will require, unless the cut is a very long one.

From "A Subscriber":—I have a "tile-floor" to lay in a store, and, having had no experience in this kind of work, would like a few "pointers" as to how the work should be done?

ANS.—In the first place, if the tiles are to be laid on wooden joists, the joists must be deep, say 2″ x 12″ or 3″ x 10″. The tops of the joists must be bevelled off to the centre, making the top like an inverted Λ, and the spaces between the joists must be boarded down about



SECTION FOR TILE-LAYING.

five inches from the top edge of the joists. On the top of the boarding must be laid concrete to the level of the joists and the whole smoothed off, and while damp a proper layer of Portland cement, not less than an eighth of an inch thick must be floated on the concrete, and on this the tiles must be laid even and level. The tiles must be well soaked in clean water before being laid on the cement. In laying tiles, always begin work in the centre of the room, and work all round until the work is completed. It is best to set straight-edges, level and out of wind with each other, then set all tiles level and true with thin gauges as shown in the illustrations. This will insure a neat and level job of work.

TESTS OF DOUGLAS FIR.

Builders are familiar with the fact that Douglas fir is among the strongest woods in the world, but figures such as have been prepared for the British Columbia Mills, Timber & Trading Co., of Vancouver, are of especial value to those interested in the subject. This company sent five fir logs to the testing and experimental works of David Kirkaldy & Son, of London, England, to be subjected to the severest bending and thrusting tests, and full data to be returned. The results show in detail that fir is in every respect satisfactory to those who have always insisted that it was one of the best varieties of wood.

The specimens give the bending test 12x15 and 16 inches in dimensions, cut to a length of 13½ feet, with a distance of 12 feet between the supports and the load applied at the center. The mean total stress in pounds and deflection in inches are shown in the following table :

Weight.	Deflection.	Weight.	Deflection.	Weight	Deflection
10,000	.027	34,000	.365	58,000	.663
14,000	.119	38,000	.414	62,000	.726
18,000	.170	42,000	.461	66,000	.804
22,000	.219	46,000	.511	70,000	.911
26,000	.269	50,000	.561	74,000	1.070
30,000	.317	54,000	.613	*78,000	1.203

*Only three pieces were given this strain.

The ultimate weight borne by the pieces was 78,714 pounds, or 35.1 tons, which was equivalent upon the beam of 93,162 pounds, or 41.6 tons. The timbers were bent to a deflection of five inches and removed.

Those tested to ascertain the resistance to depression were 12x12 and 100 inches long, with the ends faced true in a lathe. The total stress in pounds and depression in inches were as follows :

Weight.	Depression.	Weight	Depression.	Weight	Depression
40,000	.027	220,000	.114	400,000	.195
60,000	.038	240,000	.122	420,000	.205
80,000	.048	260,000	.130	440,000	.214
100,000	.059	280,000	.139	460,000	.225
120,000	.069	300,000	.149	480,000	.243
140,000	.078	320,000	.157	*500,000	.238
160,000	.088	340,000	.165	*520,000	.253
180,000	.097	360,000	.175	**540,000	.250
200,000	.106	380,000	.184	**560,000	.267

*Only three pieces subjected to this strain. **Only two pieces subjected to this strain.

The average ultimate strain of the five pieces before they were crushed was 531,656 pounds, or 3,680 pounds to the square inch, although two of the pieces withstood a stress of more than 4,000 pounds to the square inch.

CURIOUS CEILINGS.

A Russian nobleman has hit upon a curious method of ceiling decoration. Every ceiling in his mansion contains a fresco dealing with an episode in the career of his ancestors and the whole forms what is perhaps a unique example of inner roof ornamentation. Nearly 500,000 roubles has been expended upon this extraordinary work, a sum equal to approximately £71,500. Less extravagant, but undoubtedly quite as curious, is the ceiling decoration of a certain London house-holder, who has covered the surface in question with cancelled cheques returned to him through his bank. At first glimpse the real nature of this quaint embellishment is not apparent to the spectator, but the effect of same is said to be positively charming.

Chromes should not be mixed with ultramarine, which contains sulphur, as they would eventually turn brown, forming black sulphide of lead.

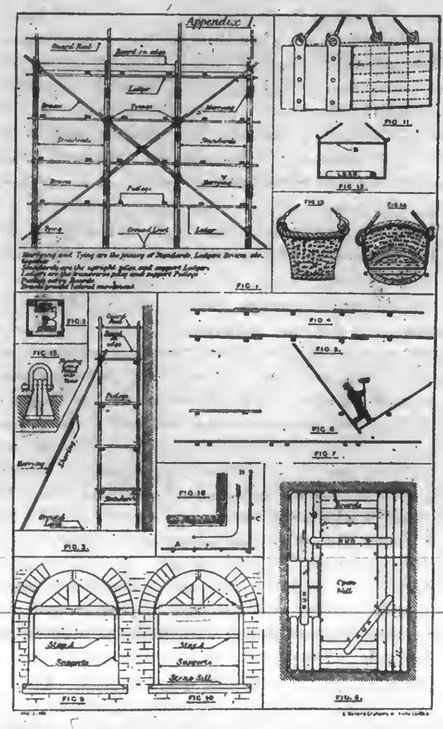
ACCIDENTS ON BUILDINGS.

The subjoined memorandum on the causes of common accidents that occur on buildings in course of construction or repair, and hints for their prevention, has been issued from the British Home Office. The modifications introduced have been made upon the suggestions of leading experts who have been consulted :—

In the following memorandum, reprinted from the Builders' Reporter and Engineering Times, an attempt is made to explain and illustrate those accidents, the causes of which may be considered controllable by the builders and workmen.

The dangerous conditions in building operations may be divided into two classes—(a) those arising from imperfect scaffolding, and (b) those arising from the lifting and carrying of material.

SCAFFOLDING--1. The two principal methods are known



respectively as the north and south country systems. The northern, as the names indicates, is principally used in Scotland and the north of England, although of late years it has also found favor in the south; the other method (see fig. 1) is essentially the south country system.

2. The first method is invariably used in conjunction with power, generally a steam crane. When one crane only is necessary it is fixed upon a triangular platform built upon three legs, one at each angle, and is raised to such a height as to be well over the building to be erected. The crane stands over the principal or king leg. Owing to the guys it cannot make a complete revolution; if power is required that can be utilised on all parts of the building, the erection has a square platform with a leg at each angle ; two cranes are then fixed, being placed diametrically opposite to each other.

3. The three or four legs, as the case may be, are of framed timber, bolted, and are weighted to the ground by masses of brickwork. The whole is so well built that accidents occurring through faults of construction are extremely rare.

4. The greatest dangers arise when the crane is imperfectly fixed, and when the weight of the crane engine and load is too much for the king leg on which it rests, and when the legs are not sufficiently far from the king.

5. With regard to the first point, the guys of the crane should always be carried to the centre of the secondary legs and chained down to the masses of brickwork which weight these legs at their feet. This chain requires frequent examination, especially when a heavy load is being raised, as, owing to the vibration of the scaffold, it becomes loose, and if not tightened the crane would lose its rigidity and accidents would be likely to occur.

6. In the second case, where the weight is great, the king leg should have an additional centre upright running from top to bottom. (See fig. 2, which is a plan of a king leg.)

7. The second form of scaffolding presents many points of interest. In order to render this report more intelligible, notes are given on the sketch (fig. 1) which explain the technical terms used. There are two varieties, again, of this form of scaffold, and their use depends upon the material of which the building is being constructed, viz., either of brick or stone.

8. Where bricks are in use one row of standards and ledgers only are necessary, the putlogs resting outwardly on the ledgers and inwardly on the wall (where header bricks have been left out for their reception.)

9. On stone buildings, and more especially when ashlar fronted and where an opening in the wall would leave a permanent disfigurement, a double set of standards, &c., are necessary to carry the putlogs. (See fig. 3, which is a section of what is known as a mason's scaffold.)

10. A few points with regard to these erections.

11. The different marryings, tyings, &c., should be carefully watched, as scaffolds have been known to come down owing to the cords slipping. This happens more especially when the cords have been used damp, the influence of a hot sun causing them to relax considerably. Wedge driving between cords and posts is the usual method of tightening.

12. The boards on which the men work should be carefully kept in position. Fig 4 shows the usual position of the boards. Carelessness may and does result in these losing their place, and if by so doing they take the position shown on fig. 5, what is known as a trap is formed. Fig. 6 illustrates the working of a trap. It will be noticed that when on the boards it is not easy to tell where the putlogs are. This creates to a great extent the danger. A certain preventative would be for the putlogs to be used in pairs, the boards then instead of overlapping could be placed end to end (see fig. 7); in overlapping boards get out of place, and a second man or two may catch his toe against the end raised.

13. Two of the commonest forms of accidents occur on these scaffolds, the falling of the workmen, and the dropping of the material from the upper floors of the erection. On the outside of the scaffold, also at the

ends, a guard rail should be lashed to the standards about 3 feet 6 inches above the scaffold boards. This would obviate the first danger. With regard to the second the danger from falling material is much to be deplored, as though it can occur in many ways, it is, as a rule, the result of great carelessness. A board on edge running along the outside of the scaffold, but within the uprights and nailed to them, and again at the ends, would, to a great extent, prevent this class of accidents. Unfortunately this board cannot be fixed on the inward side of the scaffold, as it would interfere with the free use of the workmen's tools. Figs. 1 and 3 show the guard rail and board on edge.

14. A mason's scaffold should be supported in such a manner that no opportunity could occur for it to fall away from the building. Fig. 3 shows the shoring, which is the usual method of preventing this where room permits; but this cannot be applied in a street, and in that case the scaffold should be tied to the inside of the buildings by poles through the openings.

15. There are other conditions of risk involved in insufficient width of runs, and in the use of centreing improperly supported. A run is commonly seen only one board wide (9 inches). It is needless to say that this width is dangerous; 18 inches is the least that should be allowed. A run for continued use would be better made of two 3-inch by 11-inch planks if two planks are used. A slip of wood can be nailed across the undersides to keep them together. Fig. 8 is a plan of a working platform surrounding a courtyard or well, and gives three examples of runs which are commonly used, but which are not satisfactory.

16. Improperly supported centreing is seen only in cheap work. Figs. 9 and 10 give an example of what is meant. It will be noticed that the supports to the centreing of fig. 9 are kept in their position entirely by the lateral pressure exerted by the stay A. It follows that if this pressure is eased sufficiently, say by shrinkage, it is more than probable that the centreing and a large portion of the unfinished arch would fall. Fig. 10 shows the centreing properly supported. All supports to centering should rise from a solid foundation.

16A. Painters' boats occasionally fall owing to the use of defective cordage and supports. Care is the only remedy that can be suggested.

16B. Gantries, especially those erected over the public way, having to carry great weights, should be effectively strutted and braced, and timber of sufficient strength used.

THE LIFTING AND CARRYING OF MATERIAL.—17. Very little danger arises during the lifting and carrying of material so far as the power in use is concerned. The accidents generally occur owing to the defective manner by which the material is secured to the crane, pulley wheels or whatever the arrangement for lifting may be.

IRONWORK.—18. Ironwork is principally used in the forms of girders or columns. They are sometimes slung by a chain around the middle and as evenly balanced as may be. There is considerable danger of this chain slipping, however well balanced (more especially if the load when swinging is tilted, say by receiving a jar through touching some part of the erection) and thus allowing the material to fall. To prevent this a second chain may be run from each end of the column or girder to a point some distance up the supporting chain, but the best remedy is a "softener," i.e. an old bag or sack put round the ironwork first, and the chain turned twice around it over the "softener" and knocked as close as possible, then no slipping will take place.

The same applies to timber.

TIMBER.—19. Timber in lengths can be carried in the same manner as the iron girders, but owing to the greater friction set up between wood and iron it is not so likely to slip as the former. The same precautions however, are necessary.

BRICKS, SLATES, ETC.—20. Bricks, slates, &c., in large quantities are slung in crates, in smaller quantities in baskets, and in small work are carried in hods by laborers.

21. The crates (fig. 11) will carry as many as 350 bricks. It will be noticed that they are not fitted with sides. This is to facilitate loading. The chief danger arises from their use when they are improperly packed. When suspended the pull on the handles causes the ends to take an inward slope. If the crate is tightly packed this pull creates a pressure on the material, and tends to keep it in position, but if loosely packed the absence of sides would be a source of danger, as the material could easily fall out.

22. If a similar crate was used to carry a roll of lead, it would be necessary to place a stay, (B, fig. 12) across the top to counteract and relieve the strain at the bottom.

23. When baskets are used the danger lies in the handles. If they are hooked to chains, which is the usual method (Fig. 13), the weight may and does cause them to give way. One remedy is for the chain or rope to be carried around the basket, as shown in Fig. 14. The pieces of wood marked R, if fixed as shown, would give the basket a level bottom, and would also tend to prevent the rope slipping. A better course would be so to construct the basket that the material of which the handles are made should be carried down the sides and along the bottom of the baskets and well secured thereto. In any case care should be taken to see that the baskets are strong enough in the first instance, kept in proper repair and not overloaded, and that spring hooks be used on the slings.

STONE.—24. There are several methods of lifting stone. It can be lifted in the same manner as ironwork, or may be suspended by means of a "lewis," or again by means of nippers.

25. The first method is perhaps the safest, but is generally used for undressed work only, as the chain is apt to break up any finished edges, etc.

26. The second method—by a lewis. A hole is cut into the stone wider at the bottom than at the top, three pieces of iron, as shown on fig. 15, are fitted into it, the outside or splayed pieces first, and the rectangular centre piece last. A bolt running through the top of each fixes its position, and at the same time secures a ring into which the hook, by which it is to be lifted, is placed. This arrangement will lift a very great weight, They are made in all sizes to suit; the softer the stone the deeper they ought to be in proportion to the weight. The risk of its giving way if the stone is not free from vents, or when the lewis does not fit the hole, or again, if the weight is not evenly distributed, is considerable. Its use with perfect safety can only be left to the judgment of the mason.

27. The nippers clutch the stone on the outside. Danger may arise if the small holes picked out to receive the nippers are so near the top edges of the stone that the points drag out; or again, the centre of gravity may be above the points causing the stone to turn over and fall.

28. It is, of course, assumed that the plant in use has been, both in point of quantity and quality (and the first is of equal importance with the second), fully sufficient. It is regrettable that often in actual practice this has been fuund not to be so. Inferior tackle has been and is responsible for many accidents. Many lives, again, could have been saved if a little forethought had been used, and compliance made with those unwritten rules by which workmen should be guided. Fig. 16 will give a clear illustration of what is meant. A labourer in building a scaffold required a ledger at point A. He fetched it from point B. He carried it upon his right shoulder, and in turning the corner in the direction of the arrow the end of the pole struck against standard C. The recoil immediately knocked him off the scaffold. If the pole had been on his left shoulder the blow would have fallen harmlessly, and his life would not have been lost.

The following suggestions, if carried out, would tend materially to reduce the number of accidents occurring on buildings in course of construction or repair:—

(1) All working platforms above the height of 10 feet taken from the adjacent ground level should, before employment takes place thereon, be provided throughout their entire length on the outside and at the ends—

(a) With a guard rail fixed at a height of 3 feet 6 inches above the scaffold boards. Openings may be left for workmen to land from the ladders and for the landing of material.

(b) With boards fixed so that their bottom edges are resting on or abutting to the scaffold boards. The boards so fixed should rise above the working platform not less than 7 inches. Openings may be left for the landing of the workmen from the ladders.

(3) All "runs" or similar means of communication between different portions of a scaffold or building should be not less than 18 inches wide. If composed of two or more boards they should be fastened together in such a manner as to prevent unequal sagging.

(4) Scaffold boards forming part of a working platform should be supported at each end by a putlog, and should not project more than 6 inches beyond it unless lapped by another board, which should rest partly on or over the same putlog and partly upon putlogs other than those upon which the supported board rests.

In such cases where the scaffold boards rest upon brackets, the foregoing suggestion should read as if the word bracket replaced the word putlog.

N. B.—Experiments have shown that a board with not more than a 6-inch projection over a putlog can be considered safe from trapping or tilting.

(5) All supports to centreing should be carried from a solid foundation.

(6) In places where the scaffolding has been sublet to a contractor, the employer should satisfy himself before allowing work to proceed thereon, that the foregoing suggestions have been complied with and that the material used in the construction of the scaffold is sound.

TESTS OF STRENGTH OF HOLLOW BUILDING BLOCKS.

At the present time interest is being attracted to the use of hollow blocks in place of solid brick in building construction. The advantages of these blocks are well known and some of them may be enumerated as follows: The principal advantage probably is in the saving of weight. In shipping this is of great importance, especially where the material must be sent long distances. In the walls themselves the saving of weight may often be of great importance as it lessens the loads on the other parts of the building and on the foundations. Another advantage is in the air spaces in the walls made by the hollow spaces which insure a drier wall. As regards the convenience in rapidity of laying the writer's impression is that the hollow blocks have the advantage in this, but he would request the opinions of others who have had experience along this line.

However hollow blocks are comparatively new in the construction of brick masonry and it often becomes difficult to secure their use. The principal objection which is raised to them is their lack of strength compared with solid brick This objection is so strongly urged that it furnishes a valid excuse for the presentation of a few tests which are to be described below. In the summer of 1901 the Grinell Opera House Co., of Grinnell, Ia., was considering the use of hollow bricks in the construction of their new opera house. Fearing that they were too weak for the purpose the company decided to have some tests made before deciding on their use. The specimens to be tested represented the product of the Mason City Brick & Tile Company, of Mason City, Ia., and were not selected by the company for the test. Instead they were taken at random from a pile of hollow blocks already delivered in Grinnell for the construction of another building. Hence they may be supposed to represent the average material that is actually used in building.

Four blocks were tested. Tests were made on the 100,000,lb. Riehle testing machine at the Iowa State College at Ames. The sizes of the blocks were respectively 4x8x12, 4x4x12 and 4x5x12. Two blocks 4x8x12 were tested. The 4x5x12 is an unusual size. These are the nominal dimensions in each case. Actual dimensions sometimes varied a quarter of an inch or a little more from those given. The results are indicated in the following table.

SIZE AND POSITION OF BLOCK.	TOTAL LOAD, LB.		TONS PER SQ. FT.	
	First Crack.	Crushed.	First crack.	Crushed
12x8x4-Flatwise	13,500	79,500	10.9	64.0
12x8x4-Edgewise	9,000	39,750	13.5	59.6
12x5x5-Flatwise	10,000	34,000	11.5	39.1
12x4x4-Flatwise	12,000	38,600	17.6	56.5

In all these tests the specimens were imbedded in plaster of Paris at the top and bottom which was allowed to set in 90 minutes. An adjustable top bearing was used to enable the machine to adjust itself to lack of parallelism of the top and bottom.

For comparison it may be said that architects allow

* A. Marston, in Brick.

5 to 10 tons per square foot pressure on brick masonry. This would give a larger factor of safety even in the case of walls built of hollow blocks. Of course in the wall built of hollow blocks piers of solid brick are usually built to carry concentrated loads from beams and trusses. It would take a solid wall of common brick about 80 feet high to give a pressure of five tons per sq. ft. from its own weight alone, and of course the walls of hollow blocks would have to be much higher than this before giving a weight of five tons per sq. ft., which our tests show would be only about one-tenth of the strength of the hollow block.

The writer has made a few other tests of hollow blocks which gave still stronger results than in these cases. It would therefore appear in general that hollow blocks should furnish a wall amply strong for the circumstances under which they are commonly used.

CONCRETE CONSTRUCTION IN BUILDING.

The Railroad Gazette prints the following particulars regarding the method and cost of concrete construction as employed in car shops at Elizabethport, N. J. :—

The concrete used in this work was in some cases made with an aggregate of engine cinders, in general with the porportion of 1 part of cement, 3 of Edison sand and 6 of cinders. Gravel aggregate was also used, composed of gravel as it came from the bank, mixed with sand and unscreened. About 1 per cent. was in cobble-stone two inches in diameter and over, the balance all sizes of gravel and sand to the smallest. When this was employed it was mixed with cement only, the amount of cement used being determined by experiment. In all cases the concrete was mixed very wet, so that no ramming was required. After being deposited it was puddled with a light wooden rammer to secure an even distribution. No attention was paid to the weather, concrete being mixed and deposited in any weather in which men could work.

When the temperature dropped below 25 degrees all water used was brought nearly to the boiling point and salted, using one pound of salt for 18 gallons of water. When the work stopped at night it was covered with canvas between the forms and sprinkled with salt. The forms for the work below ground were of rough hemlock; above ground, of yellow pine painted with soft soap, which gave a smooth surface. No provision was made for expansion and contraction from temperature changes with cinder concrete. This is good practice, but in gravel concrete a joint should be made about once in 150 feet. Some of the concrete was mixed by hand, some of it in mixing machines. Wherever the walls were less than 18 inches thick it was found that hand mixing was more economical, the labor cost for mixing and depositing the concrete being frequently as low as 50 cents per cubic yard. Where the machines were used the cost for mixing was reduced, but the cost for handling and depositing was so much increased as to over-balance it. In general, it may be said for building work that no machine mixer is economical that cannot be transported as easily as a wheelbarrow.

Facing putty may be prepared by mixing together equal parts of whiting and white lead and a small quantity of litharge, mixed together with boiled linseed oil. It is especially good for stopping small flaws in hardwoods.

BLISTERING OF PAINT.

A correspondent of the London Decorators' and Painter's Magazine gives the following causes and remedies :

1. Painting upon damp wood.

2. Using old paint which is fatty, which a lot of master painters do, telling the men to add some terebine to make same dry.

3. Having too much oil in the paint, and applying same too thickly.

4. Using too much driers, which causes the paint to dry on the top, forming a skin which, if followed up by other coats, dries in layers instead of forming one hard surface.

5. Boiled oil, I find, blisters sooner than raw, so I use it sparingly.

6. The painters do not use enough elbow grease in applying their paint, for I find in four cases in every six they apply too much paint on, instead of less and brushing it well out, which, if attended to, would make a better class of work.

7. The quality of materials.

8. I have also noticed several cases where fatty paint has been used. It blisters sooner on knotting than the other portions.

BUILDING WRECKING.

The building wrecking business is a comparatively new one in New York, and is the direct outgrowth of the extensive architectural improvements which have transformed the city of New York in the last two decades. When a piece of property is purchased now-a-days for the purpose of erecting on it a new business building or apartment house the owner is usually anxious to have the plot cleared for the builder, and in most instances even the foundations are taken out, so that new and more massive masonry may be constructed. It was the custom before the days of the wrecking concerns to give the builder the contract to take down the old structure on the site on which the new one was to be erected, and while some of the material was saved the greater part of it was carted away as fuel, junk or rubbish. The wrecking concerns to whom the demolition of buildings is now entrusted know the value of old building material, and usually find a market for the heaps of debris which look valueless to the layman.

"One must be an all-round mechanic, a builder, and a judge of values," said a man who makes his living by tearing down buildings, "to be a successful wrecker. It's nothing to pull down a house and save the big pieces, such as stone steps, sills and lintels, carved mantelpieces and inside fittings. That was enough in the days when there was no competition, but now-a-days we must save every foot of pipe, the ordinary woodwork, and even the nails out of the floors to get even on close bargains."

Much of the material which comes from the wrecked buildings is sold on the spot and carted away by the purchasers, but large quantities of all kinds of building material are stored in yards where they are easy of access when the customer who wants ready-made door-steps or well seasoned bricks may come to buy. Sheds are provided for the storage of doors, counters, wainscoting, window frames, flooring and trim, and racks and bins contain iron and lead pipe, gas and water fixtures, and nearly every item in the line of builders' hardware.

NOTE ON PORTLAND CEMENT MORTAR.*

By Charles P. Hogg, M.I.C.E

The object of this note is to draw the attention of engineers and others to the influence of the quality of the sand used in making Portland cement mortar. The subject was incidentally referred to in the paper on "Limes and Cements : their Nature and Properties," read by Mr. Alexander M'Ara, before this institution last session, in which he said, "As to the quality of sands, they are of very wide variety, so much so, that one part of an inferior, or soft clayey sand, will reduce the strength of mortar as much as three or four parts of clean, sharp, granite sand."

Engineers have devoted a great deal of care and attention to obtaining Portland cement of the very best quality, and of late years, fineness of grinding has been strongly insisted upon, in addition to the usual tensile test, it having been found that the fine granular residue had no cementitious value. There is no standard specification for Portland cement; but the following may be taken as a fair example of present-day practice : "The Portland cement shall be ground to such fineness that it will pass through a sieve of 2,500 meshes to the square inch, and that a residue of not more than 10 per cent. will remain in passing it through a sieve of 3,600 meshes to the square inch. Briquettes of neat cement, after being immersed in water for seven days, shall bear, without breaking, a tensile strain of 360lb. per square inch. The cement when made up neat, must not at any season of the year set in less than one hour."

In large contracts, it is usual to specify further, that the cement is to be emptied out on the wooden floor of a dry shed and turned over several times. This not only cools the cement, which is often delivered hot, but by air-slaking renders the free lime harmless.

If the cement is allowed to lie on the floor of the shed for several months, tests made from the exterior of the heap show a considerable decrease in the tensile strength of the cement, but those made from the interior of the heap generally show an increase. The results of a number of tests on this point show that the tensile strength of briquettes made from the exterior of the heap increase by nearly 300 lb. per square inch from seven up to 26 days, while the increase during the same period on briquettes, made from the interior of the heap, would probably not exceed 200 lb. per square inch.

What is known as the sand test is sometimes also specified in these terms : "The cement for testing is to be gauged with three times its weight of dry sand, which has passed through a sieve of 400 and has been retained upon one of 900 meshes to the square inch. The cement and sand having been well mixed dry, about 10 per cent. of their weight of water is to be added, and briquettes formed in moulds. The briquettes, having been kept in a damp atmosphere for 24 hours, are to be put into water, and to remain for 28 days, and they must then bear, without breaking, a tensile strain of 160 lb. per square inch."

The test for freedom from expansion, or contraction, is seldom specified, but it is important, and it is easily carried out by making two pats, 3 in. or 4 in. in diameter, on pieces of glass or slate. One of these should be placed in water, after it sets, and the other left in air. A good, sound, well matured cement should show no signs of cracking or lifting in either of the pats.

Now, while engineers have taken all these elaborate precautions to obtain Portland cement of the very best quality, they have, generally, been content to specify simply that the sand shall be "clean and sharp," and the consequence is that, in many cases, sand is used for Portland cement mortar which reduces the strength of the mortar to a much greater extent than the amount of sand added would lead one to expect.

The sand test is supposed to be carried out with sand of standard quality, but where is such a sand to be obtained? In practice the question resolves itself into the cement manufacturer supplying the very best and sharpest of sand he can possibly procure. There is always the difficulty of obtaining a standard sand, and there is, further, the objection that tests made with a standard or normal sand give no indication of the strength of the mortar obtained with the sand in use on the work under construction. The general consensus of opinion is to the effect that the finer the cement is ground the stronger will the mortar be with any given quality of sand; but if a soft, impure sand be used, the advantage of fine grinding would have been far better spent in obtaining cleaner sand or in washing and cleaning the impure sand. Both mud and shale are highly objectionable in sand for cement mortar. The precentage of mud in any sand may be obtained approximately by placing a quantity of the sand in a cylindrical glass vessel containing water, shaking the contents together a little, and then allowing the materials to settle. The particles of sand go down at once, and the fine mud in suspension in the water settles finally on the top of the sand.

The importance of using really good sand for Portland cement mortar is so great, that the author is inclined to advocate the adoption of the sand test rather as a test of the quality of the sand than the cement. Taking the tensile strength of the neat cement as a standard, he would reject any sand which reduced that strength beyond a given percentage.

Taking the qualities of the various sands into account, tests lead to the following conclusions as regards cement mortar : (1) That sand containing particles of shale should be avoided as far as possible, more especially if the shale is inflammable. (2) That, generally, coarse sharp sand is to be preferred to soft fine sand. (3) That sand containing any trace of clay, mud, or earthy matter should be washed before being used. (4) That sandstone shiver sand is as good as the best sand.

* From Transactions of the Institution of Engineers and Shipbuilders, Scotland.

TREATING MARBLE.

Compare a slab of marble, hand polished, with one that has been polished by machinery, says Mr. Halsey Ricardo. In the first instance, the surface is full of life and movement ; the light falls on its tiny depressions and irregularities, awakening wayward reflections strengthening and palliating its colors, developing its lustres and translucencies, so that it becomes rich in story as well as in hue. In the other there is the dead level of polished surface, unassailably perfect, but, comparatively speaking, uninteresting. The life and vivacity of the marble are gone ; it is merely a polished record, with the pleasant part of its individuality rubbed away into a wearisome uniformity.

CRUSHING BLAST FURNACE SLAG.

An important industry has grown up in the Schuylkill Valley region of Pennsylvania in crushing the slag found in the huge cinder banks surrounding the blast furnaces. This material is crushed to all sizes, and is used for roofing, concrete, macadamizing and the manufacture of patent stone. The demand for it has steadily increased and it is being shipped to points as far east as Boston, and as far south as New Orleans. One or two large cinder banks have already been exhausted, but there still remain many millions of tons. There are large crushing plants now established at Leesport, Moselem, Mt. Laurel, and at Bechtelsville. It is declared that only the slag produced years ago is of value, as the recent output of the furnaces is worthless for these purposes.

LOADS ON FOUNDATIONS.

The following are the safe loads recognised by the New York Building Code:—"Soft clay, one ton per square foot; ordinary clay and sand together, in layers, wet and springy, two tons per square foot; loam, clay or fine sand, firm and dry, three tons per square foot; very firm, coarse sand, stiff gravel or hard clay, four tons per square foot, or as otherwise determined by the Commissioner of Buildings having jurisdiction." In Chicago the highest load recognised is 4,500 lbs. per square foot. It is necessary therefore to devise remarkable methods to overcome the shortcomings of the natural foundations. The expense which is sometimes inevitable is exemplified by a building in San Francisco which is 75 feet square. Below the surface of the site, at a depth of 25 feet, is a concrete platform 96 feet by 100 feet, and 2 feet thick. On this is a layer of 15-inch rolled girders, making a continuous beam 96 feet long; above are alternate layers of concrete and girders, and the area thus constructed is 70 per cent. greater than the actual floor area of the building. By this costly arrangement it is calculated the pressure on the earth's surface will not exceed 4,500 lbs. per square foot.

AN INSTRUMENT FOR DETERMINING THE HARDNESS OF WOODS.

In every description of wood, by a practical man, says Mr. Herbert Stone, in a paper read before the Society of Arts, the elements of weight, hardness and colour are considered. Sometimes the weight per cubic feet is given, and the colour, apart from its fluctuations, is often accurately pictured, but the hardness is a quality which is practically left to our imagination. I have been so much impressed with the necessity of some means of measuring the degree of hardness that I have constructed an instrument which is capable of giving a fairly accurate reading of the resistance to impact of a wood (not of its hardness pure and simple, because the resistance to impact is made up of elasticity plus hardness), but it is a fair parallel to the impression of that which we call the hardness makes upon our sense of touch. I will not weary you with a description of this contrivance, but will merely mention that the principle is as follows: A steel ball of a known weight falling a definite distance upon a surface at an angle of half a right angle will fly off in a horizontal direction, and describe a curve or trajectory which will be longer or shorter according to the amount of force absorbed by the wood. A self-recording arrangement and all necessary adjustments are attached to the machine. The hard and soft zones of a wood give different readings, so that a number of trials have to be made and an average struck. I take the average of ten trials, displacing the wood five millimetres between each.

ANCIENT METHODS OF FLOORING.

Before Portland cement and concrete were introduced, builders had recourse to some strange expedients for flooring, says the London Builder's Reporter. Sir Hugh Plat maintained that ox blood and fine clay tempered made the best floor in the world, end that this mixture laid in any floor or wall formed a very strong and binding material. The usual method for earthen floors was to take two-thirds of lime and one of coal ashes well sifted with a small quantity of loamy clay, to mix the whole and temper it well with water. The stuff was allowed to lie in a heap for eight or ten days. This process was repeated at intervals until it became smooth, yielding, tough and gluey. The stuff was then laid to a depth of about 3 inches thick, during the hot season for preference and smoothed with a towel. Floors of that kind were in favour for malthouses. If cheapness was required coarser materials were used. For better-class floors, in addition to the preceding mixture, a further mortar coating was laid down to a depth of half an inch. This consisted of lime made of rag stones, tempered with a little white of eggs, the more eggs the better, to a very high pitch. It was necessary that the second layer should be laid down before the under-flooring was too dry, so as to insure their incorporation. If the flooring was rubbed with oil it was supposed to assume a polish which gratified the eyes of housewives.

BUILDING LEGENDS AND CURIOSITIES.

There is much that is curious and legendary associated with the matter-of-fact art of building. Thus, it has been written of the spire of Chesterfield Church—which many consider wonderful, though, as a fact, it is only somewhat out of the perpendicular—

Poor devil! poor spite,
To make a spire a laughing-sight.

This rhyme refers to the perversity of the builder, who originally erected the church without a spire, but, being compelled to add one, made it crooked. One of the legends attributes the mischief to the Prince of Darkness, who one day, being fatigued, folded his wings and rested on the steeple. Some of the incense which was being wafted in the aisles below escaped from the church, crept up the steeple, and tickled the archfiends' nose to such purpose that he gave a terrific sneeze and so dislocated the steeple that it has been twisted ever since! Another tale in connection with this church is that on the occasion of a wedding party passing into the building the steeple bowed to the bride and bridegroom and has remained crooked ever since. The same tradition attaches to an old church at Lancashire, of which it is said:—

The church at Little Winwick,
It stands upon a sod;
And when a maid gets married there
The steeple gives a nod.

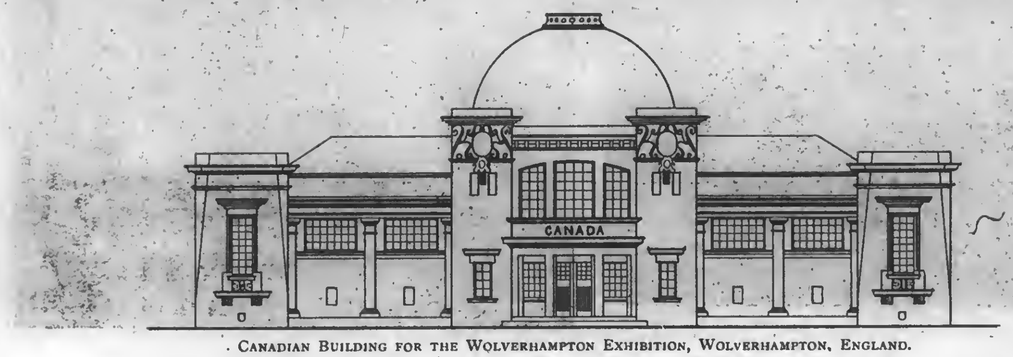
Alas! how many ages
Their rapid flight have flown,
Since on that high and lofty spire
There's moved a single stone.

THE PARK AVENUE HOTEL FIRE.

To the Editor of the CANADIAN ARCHITECT AND BUILDER:

Sir,—It pertains to you, through the columns of your now widely circulated journal—to you, say, the exponent of architectural requirement in Canada or elsewhere to abet me in endeavoring to obtain such compulsory legislation as will put an end to these ever-recurring fatalities.

I petitioned the U.S. government and that of Canada in January, 1901, to do the needful, when they both replied that it pertains to the several states of the union, and to the several provinces to legislate on such matters; while the requirement being the same it would be so much more simple and expedient for the central government to enact a law for the purpose.



CANADIAN BUILDING FOR THE WOLVERHAMPTON EXHIBITION, WOLVERHAMPTON, ENGLAND.

The architect has solved his share of the problem, it pertains now to the government to enact under penalty that what is suggested be carried out.

The system was exhibited in Paris in 1900 and reproduced by the Scientific Journals of that city which admitted it to be as set forth in the heading to the exhibit, the only sure, simultaneous and instantaneous mode of escape from the upper floors, dormitories, etc., of convents, colleges, hospitals, lunatic and other asylums, hotels, theatres, etc., for old or infirm men and women, children, the sick, the demented. By means of a walled-in stairway to reach and enter which one must go out on to a balcony communicating therewith. At foot of stairway, a fire-proof corridor reaching through the building to an exit at street level. The stairway situated at rear of building so as not to enroach on more valuable space on the street front, and the corridor raised over head or to the ceiling of the ground floor or story, that is the principal floor or "Rez de-chaussee" so called by the French; in a way that it may be passed under so as to interfere in no manner with the interior economy of the building, or circulation of the public on said floor.

CHAS. BAILLARGE,
Quebec, March 3rd, 1902. Architect and Engineer.

FIRE-PROOFING MATERIALS AND METHODS.

Mr. Edward Atkinson, the well-known insurance expert of Boston, has addressed to the Manufacturers' Mutual Life Insurance Co., the following:

A few months since, before my recent visit to England, I made an effort to secure materials and contributions for a thorough test of so-called fire-proofing materials, floors and the like, mainly devised for the protection of steel from heat. This effort was not sustained to any considerable extent by the promoters of various types of construction nor by the makers of concrete. I therefore dropped the subject for the time.

On my recent visit to London, in consultation with the architects and engineers who constitute the British Fire Prevention Association, I was confirmed in my distrust of some of the materials which have been commended for the protection of iron and steel used in construction. The attention of that Association is mainly given to what is called "fireproof construction," not only in city buildings but in factories and workshops as well.

Our attention has been mainly given to the slow burning construction of brick and timber, and we have not yet been called upon to deal in any large way with steel construction. In anticipation of such demand upon us it is necessary for us to know the present state of the art.

In Great Britain it is said to have been proved that many of the concretes, some of which are there called "breeze," of which coal ashes are the principal component material, are very destructive to iron and steel. These ashes come from coals containing a good deal of material which may cause corrosion, and the long-continued contact even of dry ashes with iron and steel beams, wire or thin plates, imbedded in them, is said to oxidise them. This may come however from the avidity with which ashes absorb humidity from the atmosphere and may be attributed to that rather than to any other fault in the ashes.

Any concrete or any material containing plaster of Paris (sulphate of lime) is known to be somewhat dangerous if not destructive, and there may be other causes of corrosion as yet unknown to us. We know of some cases in which corrosion has set in very rapidly on gas pipes and on cribs of rails intended for foundations, owing to corrosive qualities in the concrete in which they were imbedded. We are aware that many investigations and reports have been made by the representatives of special methods, but we are not informed of any general report or conduct of tests corresponding to those now being made by the architects and engineers who have organized the Fire Prevention Association of Great Britain. We therefore address the following questions to you:—

1st. What attention have you yet given to causes of corrosion other than ordinary humidity which may get through minute cracks in any kind of veneer or covering for steel members? In other words, what causes of corrosion have been developed in your practice other than those arising from dampness?

2nd. What precautions have been taken to meet this hazard?

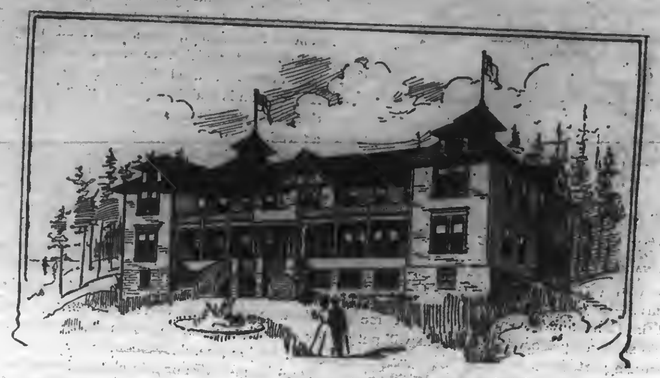
3rd. What general or special information has been printed upon this subject? Who are the authorities and what printed material can be found and where?

4th. What studies are you yourselves making in this matter?

5th. What knowledge have you of active corrosion from dry materials coming in contact with the iron or steel frames, posts, or other members of any building, or iron used in foundations?

6th. To what extent do you depend, if at all, upon angle irons, wire or sheet metal imbedded in concretes for floors or arches, for the stability of the floor after the cement or concrete has become permanently set?

I have asked these questions with the intention of making arrangements for an exhaustive study of this subject and for such tests as may be possible of each and all the various coverings now upon the market for protecting iron and steel; the concretes, the fireproof floors, and all other matters in which corrosion from any cause may be a source of danger."



FREE HOSPITAL AND COTTAGES IN CONNECTION WITH THE SANITARIUM FOR CONSUMPTIVES AT GRAVENHURST, ONT.

APPORTIONING THE COST OF PERMANENT PAVEMENTS.

Alderman Crane, of the Toronto City Council, has given notice of his intention to move that the city engineer be instructed to report to the Council the class of pavements which he considers (taking into consideration the locality where the same is laid) to be permanent pavements, and that the Council determine the class of pavements which shall be deemed permanent, and that thereafter the local improvement or other by-laws affecting the same be amended so as to provide that where a permanent pavement is once laid as a local improvement, the same shall be kept in perpetual repair out of the general funds of the city. This action on the part of Alderman Crane is in the right direction. The local improvement system, as it at present exists, is, in some respects, very unfair to property owners. The persons who are most benefitted by permanent pavements are owners of departmental and other stores who use a large number of vehicles for the delivery of their goods. These companies effect a large saving yearly in horses and vehicles by reason of the improved pavements which have been put down in recent years, the cost of which has been charged, to a large extent, against the property owners on the various streets. We refer now more particularly to the residential streets where, it is safe to say, the pavement is least used by the owners of the property fronting on the street. This being the case, it is manifestly unfair that that the property owners should be called on to bear so large a proportion of the cost of improved pavements. While it is no doubt true that the value of property is, to some extent, enhanced by the putting down of good pavements, it is also true that increased assessment invariably follows, so that the net advantage is small. A larger proportion of the cost of such pavements should in future be borne by the taypayers as a whole, while if means can be found of placing a considerably increased assessment for this purpose on the shoulders of the owners of delivery wagons, it ought to be done.

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EDITOR'S ANNOUNCEMENTS.

Contributions of value to the persons in whose interest this journal is published are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

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NOTES.

Mr. O. G. Carscallen, Vice-President of the Gurney Tilden Company, of Hamilton, was recently presented by the travellers of the company with a gold-headed cane.

Professor Galbraith, Principal of the School of Practical Science, Toronto, was the guest of honor at a dinner held on Feb. 28th by the S. P. S. graduates resident in Pittsburg.

The outcome of a lawsuit at Cleveland over a party wall dispute, has led to the giving of positive orders to the city engineering and building departments, to carefully survey property on which business buildings are to be erected in future and establish beyond question the lines of the lot or plot of ground on which such improvements are to be made. This will prevent a repetition of this case. Other large cities might profit by Cleveland's experience.

Analysis of the incrustations taken from the Portland stone balustrade round the base of the dome of St. Paul's Cathedral, shows them to be composed chiefly of hydrated sulphate of lime associated with some siliceous matter and minute particles of carbon in the form of soot. The solvent action exerted by rain charged with sulphurous and sulphuric acid derived from the gases and smoke of innumerable chimneys of the surrounding buildings, has, after the lapse of two centuries, transformed the original carbonate of lime of the Portland stone into sulphate of lime, which in a more or less soluble condition has been carried by water action and gradually deposited as calcareous tufa or stalagmite on the underside of the coping-stone.

Owing to its remarkable hardness, elasticity and durability, it rivals the best wax finish, but is free from its unpleasant slipperness.

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It dries dust proof in about three hours.

Being very penetrating it closes the pores of the wood against disease germs, making it invaluable for hospitals, asylums, and similar institutions.

Architects patronize home industry and specify Granitine Floor Finish.

The Canadian Architect and Builder

VOL. XV.—No. 172. APRIL, 1902.

ILLUSTRATIONS ON SHEETS.

Physician's Office and Residence, College Street, Toronto.—Beaumont Jarvis, architect.

ILLUSTRATIONS IN TEXT.

St. Paul's Presbyterian Church, Brandon, Man.—W. H. Shillinglaw, Architect.
Portion of Chimney Hood.—Designed and Executed by the Elliott & Son Co., Toronto.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Tite Prize Competition, 1900—Design for Gateway to a Public Park, submitted by Messrs. Thos. McLaren and Andrew Sharp, A. R. I. B. A.
Royal Life Insurance Building, Montreal.—Hutchison & Wood, Architects.
Conservatory and Crematorium, Mount Royal Cemetery, Montreal.—A. T. Taylor, F.R.I.B.A., Architect.

CONTENTS

Editorial	45	Mount Royal Crematorium	56
The Beautifying of Cities	46	Lesson of the Park Avenue Hotel Fire	56
Library Design	47-48	Obituary	ix
City Planning	49-50-51	The House that Jerry Built	ix
Northwest Letter	53	An Ideal Door, Sash and Box Factory	x
St. Paul's Church, Brandon, Man.	53	Correspondence	x
Personal	55		

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Builders' Conventions.

THE National Association of Master Builders of the United States held an informal meeting in Washington on March 5th to arrange the preliminaries for a regular convention to be held in the same city next October. Three years have passed since the last general convention of the Association. The value of such gatherings is recognized as affording opportunity for considering all important questions affecting the building industry. An occasional convention of the master builders in the various provinces of the Dominion would no doubt prove beneficial to all concerned. Apart from local Builders' Exchanges in a few cities there exists no organization in Canada among employers in the building trades.

City Improvement.

ON the 23rd inst. an influential deputation will wait on the Board of Control of the Toronto City Council, to urge that a sum of money be appropriated sufficient to cover the cost of a report and plans by an expert for the future improvement of the city. It is understood that private subscriptions have been offered for this purpose on condition that the City Council will make an appropriation. It is certainly time that action should be taken in the direction of working out the improvement of the city on definite lines instead of piecemeal, as in the past. This should be done in the best possible manner under the direction of an expert of wide experience. The plan should include not only the city proper but the outlying parks. The cost of a preliminary report and plan should not be very large, and the working out of the scheme could then be proceeded with year by year. It is hoped that the Council will be as much alive to the future welfare of the city as are the public spirited citizens who are moving in the matter.

Some Lessons from New South Wales.

A gentleman who recently spent some time in visiting Canada after having lived many years in New South Wales, has some interesting things to say about that country. He describes it as a country of vast natural wealth. As evidence of its development mentions that, although the population is only 800,000, the export trade amounts to £13,000,000 annually. He states that New South Wales appears to be the Mecca towards which political theorists and economists tend, and in consequence socialistic ideas prevail to a much larger degree than in Canada. For example, all railways, telegraph lines, and public works of every kind are managed directly by the government. Asked regarding the result of these conditions, his reply was that under the prevailing system the cost of public

works is very much greater than would be the case under our system of constructing such works by contract. Another deplorable result is that bribery and corruption universally prevail, and the standard of public morality has become sadly impaired. Some years ago the government of New South Wales borrowed a large sum of money for the purpose of constructing a railway from one end of the country to the other, a distance of about 1,000 miles. This money, however, was never used for the purpose for which it was borrowed, but has been diverted and frittered away on a great number of minor objects. Much of it no doubt has found its way into the pockets of the politicians. There is here food for reflection for the press of this country and those who are clamouring for the control by the government and the municipalities of all kinds of business enterprises.

Bricklaying in England and America.

Much interest has been awakened among architects, builders and building workmen in England by the results achieved by the contractors in the construction of the British Westinghouse Electric & Manufacturrng Company's works at Manchester. The contractors are an American firm, Messrs James Stewart & Company, of St. Louis, Mo. Previous to the commencement of work on this factory, the average number of bricks laid per day by Union workmen in England was about 450. In a letter to the "London Times" Mr. Stewart states that the average attained under the direction of his superintendent on the Westinghouse Company's buildings has been from 1,400 to 1,800 bricks per man per day of nine hours. The averages mentioned included face brick work. On common work an average of 2,250 bricks per man per day was reached. The walls range in thickness from 19 to 23 inches. The bricks were laid in mortar. In the construction of a chimney stack at Birkenhead, by the same contractors, an average was attained of 1,976 bricks per man per day of nine hours. Mr. Stewart states that the results achieved in the last mentioned case were in part attributable to the facilities afforded the workmen, such as a double platform lift, each platform holding two barrows of bricks, one ascending the other descending. Only fifteen seconds was occupied in raising this platform to a height of 150 feet. Soft mortar was used instead of the stiff mortar usually employed in England, thus permiting enough mortar to be laid with one stretch of the trowel for half a dozen to a dozen bricks, and allowing of the bricks being laid by a light pressure of the hand and a light tap of the trowel instead of by repeated hammering of the trowel to force the brick into place as in stiff mortar. As an incentive to the workmen, they were paid 1½d per hour above the Trade Union rate. A record was kept of each man's work and the workman who failed to measure up to the standard were dispensed with. The new standard for workmen which has thus been established by American contractors should result to the advantage of English employers and prove a hard blow to the efforts of the Unions to restrict, to the greatest possible extent, as in the past, the amount of work which Union men shall perform. Mr. Stewart states that in the United States the workman's average per day is from 2,000 on the best class work, such as private residences, including face brick as well as common, to 2,500 and even 2,700 including face and common on other structures. This is far above the Canadian standard. The average here is from 700 to 1,000 bricks per day according to the character of the work.

Justice to Tenderers

The final action of the City Council of Toronto, with regard to awarding contracts for concrete sidewalks, tenders for which were received recently, is being looked for with much interest. When the tenders were opened, it was found that a firm of Chicago contractors had put in the lowest bids for the bulk of the work, and the Board of Control recommended that the contracts be awarded to them. Immediately that this decision was announced, the alderman were besieged by local contractors, and the cry was raised that the successful tenderers should not be given the work because they were aliens. This objection having come to the ears of the Chicago firm, they sent a letter to the city authorities expressing their willingness to open an office in Canada, and to employ none but Canadians and Canadian material in the carrying out of the work. To our mind, this offer removed every legitimate ground of objection, and should have secured them the contracts. Such, however, has not so far been the result. The local contractors have organized and are evidently bringing to bear as much pressure as possible to compel the aldermen to withhold the contracts from the lowest bidders. It is to be hoped that a majority of the members of the Council will act justly in this matter. The local contractors are not entitled to these contracts, first, because their tenders were not the lowest submitted, and second, because they are suspected of having agreed together to extort from the city an exorbitant price for the work. If the Council violate the principle of giving contracts to the lowest tenderer, where the securities and all other conditions have been complied with, they will justly be accused of sacrificing the interests of the tax-payers and of dealing unjustly by outside contractors. The result will be that in future no outside bids will be submitted for the work in Toronto, and the local contractors will be in a position to charge what they please. The Council should either cease to publicly advertise for tenders, and let it be known that no outsider need apply, or stand by the principle of giving contracts to the lowest bidder whether he be an insider or an outsider. Since the above was put in type the contracts have been given to the City Engineer.

THE BEAUTIFYING OF CITIES.

The Park Committee of the City of Sherbrooke, P. Q., have arranged with Frederick G. Todd, Landscape Architect, of Montreal, to prepare plans for their various parks and squares. Mr. Todd's contract covers five years and, aside from planning for the parks, he will make a report each year dealing with the growth and extension of the city, which will take up its future needs as regards the location of public buildings and streets and the beautifying of the city.

The City of Sherbrooke is specially fortunate in having set aside an unusually large amount of land for parks and playgrounds, the area, according to the 1901 Park census, being greater in proportion to the number of inhabitants than any other city with the exception of two or three in the United States. It is a matter for congratulation also that the City Council have decided thus early to have a general scheme definitely laid down which can be followed from year to year.

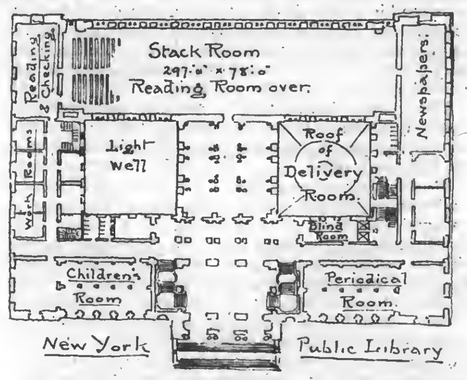
LIBRARY DESIGN.

In former days a library was essentially a place where books were kept; now it is essentially a place for giving out books. The value of the volume was the original motive for building; the value of its contents is the motive now. So that a library has become a place where books are stored, safely of course, but for the main purpose of distribution on as large a scale as possible; and the leading idea is how to get the books into the hands of the reading public. Librarians are not even content with this, but want to enlarge the limits of the reading public and create a reading public of a better kind, by taking the younger generation in hand and inducing them to read good books.

This being the case the commercial analogy has impressed itself upon library methods. Librarians trying to reach the public take a hint where they can from the shopkeeper. Books on China were rushed to the front in Toronto Public Library long before the allied forces reached Pekin. A special Prohibition catalogue is out now, to educate the voter for the coming struggle. Slips with a list of the better books of a kind are prepared in some libraries as book marks to entice the reader, especially the young reader, from his affection for the worse.

Along with these small arts of reaching the public the great schemes have been considered, and are to some extent adopted. The late Dr. Poole of Chicago had the Newbery Reference Library built somewhat on the system of a departmental store; each department of literature in a room by itself; so that instead of conveying books from a far distant depository to the reader in a general reading room, the student can go to the department in which his researches are being made and take down for himself the books he wants. This is certainly a great idea and should be, in the case it suits, a complete success. But there must be many cases for which the system creates difficulty for the reader. A reference library is the very place where one wants to be in contact with two or three departments at once. An historical work on the first floor is likely to require for its elucidation a map from the map room in the attic and an article from the periodical room on the ground floor. It seems in fact as if this system could be applied more practically to the lending department, so as to avoid procuring books from the stack rooms by a machinery of pneumatic tubes, automatic lifts and electric railways, upon which a planner pounces at once as an indication of something wrong in the plan. A borrower wants but one book; or, if he wants more than one, he wants them to take away with him; and there is no reason why he should not go from the department of fiction to that of science or elsewhere and pick up his books as he would his purchases in a departmental store. The department rooms in different stories could back upon departments of the many-storied stack room so as to bring the attendants into close contact with both the books and public; or even, if it is desired, continue into the middle class of libraries the system of open access to the shelves which is now so much in vogue in libraries of the smallest class. But open access is still on its trial. The public seems to be "indifferent honest;" and there are other difficulties, which increase with the size of the library; so that there is no question at present of open access except in small libraries.

The large public library would require a series of articles to itself. Both the public department and the working department are multifarious and tend to increase. On the one hand the library may combine, with its book departments, galleries for the display of pictures, prints, photographs, rare books and other educative objects, besides rooms for special studies, which require not only books of reference, but such additional circumstances as a table for drawing instruments, space to spread out specimens from a hortus siccus, or quiet to use a microscope. On the other hand, behind the scenes, the ordinary works of receiving, preparing, cataloguing and checking the books may be supplemented by printing and binding shops, arrangements for dealing with branch libraries, etc. These are the variations that occur in any problem and for them the architect must be briefed. It would take too much space to study now these minor circumstances, but the essential conditions of the problem may be summarized, as they appear in the plan for the New York Public Library; a plan so well considered and carried out that it may be taken to represent the best that is known on the subject at present.



The stack room runs across the back end of the building, sideways on; so that it may be duplicated without carrying the ultimate limits of the stack room further away from the delivery desk than is the case in Boston now. In this position also the stack room is in contact with the main building all along its length, and comes into close communication with numerous minor reading rooms. The main reading room, for 800 readers, is on top of the stacks. This is the proper place for it, not as in Boston in front of the building, with the halls between it and the stack room. Placed over the stacks, very simple arrangements suffice for communication and the delivery of books; and there are additional advantages in the way of quiet, of light and air, and of construction. There being nothing above there is no need for columns, which are not impressive when dotted over an area of this kind. The 78 feet span may be roofed over clear and make a noble feature. Finally there is the principal advantage, that the reading room can grow as the stack room grows; for, when the stack room is repeated, the reading room can be repeated too.

The other great points in this plan are that the book borrowers—the people who merely come and go—are kept away in a place by themselves; a large room, convenient for the borrowers and in close connection with the stacks, but in the basement with a side entrance peculiar to itself. The rest of the floating population are confined to the ground floor; the periodical and newspaper readers are on one side and the children on the other, as near as possible to the entrance. Thus quiet is secured for the rest of the library.

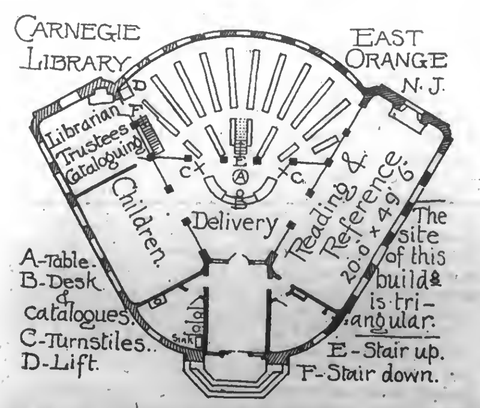
There is an undetermined middle ground between the large library and that which may be classed as

small. The essential distinction which lifts this division above the small library class is the extension beyond the power of control by a central office. Detailed supervision passes from the hands of the librarian into that of a staff; and the librarian's office, instead of being the first thing to meet the eye, should be, though accessible, retired. In other words the library has reached the sub-divided stage and sub-division—the unified sub-division which keeps all purposes apart but all in touch with the books—is the main thing to be brought about. The borrowers should be kept as far as possible from the readers; the children from the grown-up readers; and the newspaper readers from both. In short the principles illustrated by the plan of the New York library may be applied on a much smaller scale, as long as there are similar combinations of purpose.

The small library has more direct poetry than any, and is an attractive problem. But its basis is severely practical. The poetry consists in the building's unity, and therein lies also the practical basis. A librarian with one or two assistants must attend to everything and oversee everything. Hence the public functions must be all on one floor and as far as possible all in sight from the administrative centre. This will make smooth the path of the librarian. It is necessary also to make his paths short. A few unnecessary feet to be traversed, coming and going all day everyday, mount up in the aggregate to a great deal of unnecessary work; and the more easily the librarian can do his work the better the public is served.

The problem is therefore to arrange space for purposes of different kinds, all so separated as to avoid mutual annoyance, yet all in close communication with the librarian's office.

It would be well to assume a fair standard of accommodation for the present purpose, taking the stage of library development suitable for a small town. It is for libraries of this kind that Mr. Carnegie's recent gifts to towns in this country will be chiefly applied. We may then perhaps assume not less than: 1. For the public; a reading room for the grown up people, a reading room for children, and ample space apart from these for the coming and going of borrowers. 2. For the librarian; a delivery desk and a private room in connection with it; for talking is not the thing in a library, and if the librarian wants to talk at length he should have a place for seclusion, for the sake of the public as well as for the sake of privacy. There should be also working room for unpacking, marking and cataloguing the books. The unpacking room would be best in the basement, but the other work should be done on the ground floor, in close connection with the librarian's office. 3. For the storage of books; plenty of room now and an opportunity to grow.



The last sub-division is the most difficult part of the library plan on account of the continual increase of the number of books. The difficulty is complicated by the present manner of admitting the public to the bookshelves. If the librarian is to keep an eye upon the stacks where the public are handling the books, undoubtedly the circular stack room with radiating stacks is the best. If future extension of the stack room is to be considered, undoubtedly the circular form is not the best. One is inclined to think that there is too much stress laid upon the need of making a sort of policeman of the librarian. There is a New York story of a man who came down Broadway, under an umbrella, in a heavy shower. The doors on both sides of the street were full of people taking shelter; people who had not umbrellas and wanted them. The man lowered his umbrella at a shop door, looked round upon the assembled multitudes, stood up his umbrella against the wall and went in. The public will police each other if there are enough of them. There is also such a thing as creating a sentiment of honour by assuming it—judiciously. To some minds it might become a sort of sport to circumvent a fussy librarian by irregular borrowing; whereas if this were assumed to be (as it is) an act of public dishonor too mean to be thought of in connection with respectable people it would cease to be a temptation. There will always be a sprinkling of the naturally bad; but the best means of throwing difficulties in their way is to tone up the rest.

The librarian's principal business is to help the public to get the books they want or ought to have; and the principal need in the book room is plenty of space for the needs of this generation and a chance for the next to enlarge it if they want to.

The most obvious arrangement of these functions is to place the book room and working offices in the rear, the reading rooms and delivery hall in front and the librarian between. The delivery hall and desk will come naturally in the middle and the reading rooms on each side. Fortunately the reading room for grown up people is usually required to be of a larger size than that for children so that it is not necessary to make the front part of the building symmetrical in plan. In a building of such small size and so few parts, symmetry is difficult to manage without producing a dull exterior effect. If there are supplementary public rooms on an upper floor to be approached, the clear sweep of rooms on the ground floor is most easily preserved by throwing the staircase to the front, where t will be of great service in establishing an unsymmetrical balance of parts.

Inside there is room for a large effect. It has been urged that, for the purpose of keeping all parts in view from the delivery desk, the library should consist f an area under a single roof; subdivided, on the floor only, by desks, seats, bookcases and balustrades. Fortunately this expedient would not so well serve the end in view as a more architectonic method. It is the floor that is to be kept clear not the ceiling. The continuous ceiling would be a great sound carrier and is better broken. For architectonic purposes also—to give a sense of seclusion in the various rooms—it will be necessary to sub-divide the ceiling; for the eye measures a room by the ceiling rather than by the floor. If therefore the rooms are divided from the hall by an open screen of columns, there will be a satisfactory sense of seclusion in the reading rooms; while the eye can range the whole length of the library, with a sense of space increased by the intervention of columns; and everything will be in sight from the delivery desk. Columns are a slight obstruction to a person immoveably seated in a pew at church, but none at all to one moving about; and the delivery desk has usually a bowed front to give it greater extension into the hall.

It is not possible in a short space to enter further into the question of plan, much less to discuss matters of detail; high light in the reading rooms, artificial ventilation screened from dust, washable floors, the make and dimensions of book cases, etc.

The present article is only an attempt to appreciate the situation as a help to imagination in planning.

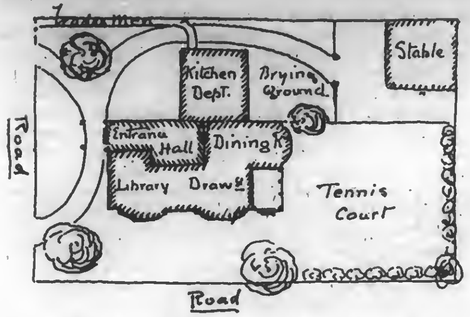
W. A. LANGTON.

CITY PLANNING.

LECTURE BY W. A. LANGTON, PRESIDENT ONTARIO ASSOCIATION OF ARCHITECTS, BEFORE THE CENTRAL ONTARIO SCHOOL OF ART, MARCH 20TH, 1902.

I want to begin at the very first principles and find out what it is that makes a city beautiful; for if you fill a city with statues and fountains, you have but filled it with beautiful objects. What we want to do is to make the city itself beautiful.

At the bottom of everything that is beautiful, there is a plan. Every good thing that is made, is made according to a plan: a house, a piece of furniture, a piece of machinery.



I have placed upon the board an illustration of this. I am not going to talk to you about house planning, but this is something that we will all understand which will show the nature of planning, and I have therefore put upon the board the design of a house for a country town, on half an acre. The first essential in making a good plan is that the house shall be divided into its several departments in such a way that they do not clash with one another. On this design the family living rooms are colored blue, the kitchen department is colored yellow, and the public part of the house — the entrance, staircase and hall—are colored red. I wish you to notice that they are all contained in themselves, that there is no blue in the red, and no yellow in the blue; that there is no conflict. The kitchen department has to do with the dining-room, and therefore the living rooms touch the kitchen department at this point. The kitchen department also overlaps the public portion just at one point by which it gets communication with the front door. The public touch the kitchen only at the front door; they touch the other living rooms. This principle extends not only to the departments of the house, but also to all the departments of the grounds.

The service department outside does not touch the living part. As the north side of the house is given up to the service department, the north side of the lot is given up to the stable and yards. The drive from the stable runs along the north and meets the public drive at the entrance on the north-west. Thus, just as the living rooms of the house occupy all the south and eastern sides, all the ground to the south and east is private, not intruded upon by either service or the public.

When this design was received, the owner had only one suggestion to make. He thought the stable ought to be placed in the south east corner. See how this upsets everything! The stable drive must run all round the south side in front of the living room windows. The tennis lawn can only exist by being shoved up by the drying ground. The man, when he goes from the stable to the kitchen must either cross the tennis lawn or go round by the drive past the drawing room windows and the front door.

That explains the nature of a plan.

The first consideration in making a good house plan then, is that the functions should be kept together. In the same way, the first thing that we have to consider in planning a city, if we have the opportunity of planning it from the bottom, is to keep all the functions together. It is not so difficult to do this after a city is started as you would think, because to a great extent functions do keep together. There are cities now which are almost perfect in this respect.

In Boston, when they laid out the Back Bay—I fancy everybody knows something about the plan of Boston: there was the old city surrounded by a low, marshy district, and beyond that the beautiful suburbs. They have filled in the marshy district (the Back Bay), and made it the principal residential part of the city. In so doing they made Commonwealth Avenue, a long wide avenue with rows of trees, which goes through the Back Bay and connects Boston Common, the edge of the city, with the suburbs, so that the rich man who lives in the suburbs, which are as beautiful as any suburbs in the world, can come to the city and go back every day and need never in the whole course of his existence, unless he wants to, see anything squalid. He can drive along treed avenues all the way to his office, and so all the way back again. His church is on that line. His office, if he has an office, and the principal shops which he will frequent will be within a stone's throw of Boston Common. His Club faces it.

In the old part of the city there is another story. Here you have shipping, warehouses and smells. Here also the poor and disreputable people live. And instead of the spick and span appearance of the elegant part of Boston, you will find streets covered with paper as ours are with maple leaves in November.

That is an illustration of how a city can, subsequently to its first planning, be made or arranged so that the functions, the different parts of the city, keep each to itself.

In Berlin there is a law which divides the city into districts, and does not allow any conflict in the districts. It is not lawful to put up a tall apartment house in the middle of the villa district. Liberty, after all, is relative. A man cannot do what he likes in every case. One ought not to learn the cornet in a lighthouse. And a first principle of city life is that a man cannot do what he likes with his own. If any one doubts that, let him try to start a glue factory on King Street, between Yonge and Bay Streets, and see what happens.

It is only necessary to extend that principle in practice to find that we restrict to a great extent the building and other arrangements in different parts of the city. I have here an extract from a By-law which was passed in Rochester, in 1899-1900, which says: "It is inequitable as often happens to sections of our city which have received a trade mark of special value by reason of residential unity and beauty to have some vandal destroy such special value on the plea that "'he has a right to do what he likes with his own property.'" They passed that by-law and decided for Rochester that a man has not a right to do what he likes with his own property. That is the first foundation of municipal planning and municipal intervention in making a city beautiful, that a city has got something to say as to what is to be put up in the different parts of the city.

It seems to me that one of the first considerations for a beautiful city is that there should not be such a mixture of business as we have got in Toronto. Factories should be in an outlying part of the city, and the offices and residences should be in touch with one another.

Why should a factory be within a city? The use of a city is not as a place to make things in, but as a place to carry on the transactions resulting from the transfer of the things made. The business transacted in a city is transacted with the offices and agents of the factory, not with the operatives. Therefore the factory space, the factory smoke and the operatives are all external matters introduced into city life only to clog its simplicity and ease of action.

Then look at the other side. The factory operatives come into town hastily in the morning only to go out of it in haste in the evening. Why should they do this, when their work could be done just as well in the suburbs? It is not work that is the labourer's curse, but want of leisure; and that he should be required to waste what little time he has that he could call his own

in going to and from home in crowded street cars—a journey that is likely to increase in distance continually, rather than to diminish,—is an evil which is not necessary; and to take steps to get over this state of affairs is to do the best thing that can be done to ameliorate the labourer's lot.

Whatever coming and going between factories and the offices and warehouses in town is necessary can be done more easily and perfectly by one or two persons, or, as it is done now, by an electric spark. It would not be necessary to do more than speak through the telephone, in most cases.

Does not this idea present a more alluring picture? Land is dear in the city, but out of it,—when once it is accepted that communication with the city is by telephone, motor or railway for individuals, there is nothing to hinder factories stretching freely over the land, with room for the hands to live about on land enough to have gardens which they can cultivate in the leisure saved by living near their work, and in this way add not only pleasure but profit to their lives.

It is inevitable that if the factories are placed where land is not too costly, the plan that Messrs. Lever Brothers have adopted, of making an industrial village, will be followed by other large works. There are other instances of the kind in England. There was an article in a recent Studio, giving an account of another institution of the kind, with a village in which the buildings were all designed by a good architect, making a very pretty village.

What the factories really want is not to be in the city but to be near the railway. They line the course of the railways, and that is why they come into town. What we want is both that the factories should be out of town, and that the railways should be with them. We are all agreed upon that point.

The thing to do is to bring in only such arms of the railways as are needed to deliver passengers and such goods for retail purposes as are necessary.

I have dwelt upon this point at some length, as I think that is really important. Present conditions are the cause of a great deal of backwards and forwards travelling in our own city and in most other cities, and to get over it in some way would not only lighten the labour but brighten the lives of the persons who work in the factories, and would make the city which is deprived of their presence a much more beautiful and agreeable place to live in.

That brings me to my next general point on City planning.

As the gate of a city has always been conspicuous, so at the present time the gate of a modern city, which is the railroad station, ought to be conspicuous. We have all known, no doubt, what an advantage this is in a strange city.

This brings me to inquire into the question which was brought before us by the World a few years ago as to the extension of Queen's Avenue, as they call it now, down to the Union Station. I have had a slide made to show what stands in the way of such a scheme being carried through. At the time the scheme was first mentioned there was nothing on the line but a few old buildings and a number of sheds. Now there are two solid buildings added. The difficulty this scheme met with was I fancy the idea that the work of making and paying for the new street would come upon us at once if the proposition were adopted.

There is a way of doing such things in France, which seems to the American Architect, from which I quote, to be "economical and judicious," "the practice," that is, "when a street needs to be widened, of condemning the land needed to carry out the alteration, and paying for the land alone, at a fair valuation. The buildings existing on the land are not disturbed, but the owners of the estates, in consideration of the purchase of the land, are prohibited from making any alteration in their buildings which will prolong the existence of the portion standing on the condemned land. In the rapid changes which go on in city life, it is seldom necessary to wait many years before the owner finds it for his interest to alter or reconstruct his building, and the land previously condemned is then thrown open to public use."

By a method of this kind it would be possible to plan for the future; so that a scheme for the well being of the city could not be obstructed by anything being done, which would make it impossible to carry out the idea when it becomes feasible to do it.

The next thing which I should like to consider in the planning of a city is the advantage of compactness. We recognize this advantage in the planning of a house. I think it will be found an advantage also that the city should be as compact as possible. I think we scatter along the ground too much in Toronto. That is a great disadvantage in many ways.

One of the trials of life here is the distances we have to go and the difficulty we have in getting about.

I remember when Toronto and Albany were about the same size, that is with about ninety thousand inhabitants. I lived in Albany for some time then, and was struck with the difference between what I could do in a given time in Albany and what I could do in the same time in Toronto.

Albany is built on the hillside, on the Hudson, and the whole town does not go back more than a mile, I should say, and does not extend two miles in length. Even at that time Toronto spread over a great deal of ground. The west end was then where it is, the east touched the Don, and Bloor Street did not bound the north very exactly.

Arriving at Albany by an early train, I went to the Capitol at half-past seven and made an appointment for nine o'clock. Then I looked up a lodging, and I remember going into two or three places before I was satisfied; after that I went down to the station and got my luggage, returned to my lodging, unpacked, made my morning toilet, and kept my appointment, all in an hour and a half; and I am not sure but I breakfasted, too.

What could one do in Toronto in an hour and a half in the way of going from the Union Station to the Parliament Buildings, then down to Church Street, to hunt up a lodging, thence to the Union Station, back to Church Street, shave, bathe, dress and get back to the Parliament Buildings; all by walking except for the necessity of a cab to bring up the luggage. This is an absolutely fair comparison of the relative position of localities and distances in two towns of an equal population, but built on a different plan.

I complain of the unnecessary distances, but there is more than that involved. Consider the nondescript character which it gives to the city.

We are proud of Jarvis Street, and a good street of that kind is an ornament to the city and agreeable to live in; but we do not want humble imitations of it all over the city.

These suburban streets and suburban residences in the heart of the city are misplaced. We cannot afford to give the space they really require. The houses are detached from one another but that is all. There is not room to put windows on every side. It is done; but the result is distressing even to look at in passing by. We should be much happier if we frankly adopted the idea of never having windows on the side, and put the houses close together.

I was going up Bond street, an old-fashioned residential street, the other day with this lecture in my mind, and was struck with the fact that it is really a more characteristic and interesting street than Jarvis street. I do not want to be misunderstood as saying that Bond street is a finer street than Jarvis street now, but it has the elements in it of the proper kind of beauty for a city street. There would be a row of three or four houses and then a big house with a little ground at the side of it. The contrast of solidity and openness gives a varied picturesqueness, beside which the straggle of houses all slightly detached but not essentially separated is monotonous and without character. Solidity is the first attribute of a city, and foliage or verdure interchanged with it, or backed by it, has twice the value it would otherwise have.

Another principle in all planning is that the best sites should be used for the best purposes. In a city the best sites should be used for public purposes. I think we have passed the time when private power or wealth can absorb the best there is in the city, and I think we may take it as a principle that the best site in the city should be taken up by the "city," as we say, that is for municipal purposes.

In Quebec the best site is Durham Terrace. The Citadel of course is also used for public purposes and may perhaps some day make an additional pleasure ground for the people.

At Montreal the same principle holds good. They have the Mountain park.

At Ottawa the Parliament buildings have the finest site in the city, or, in fact, I should think, in the province. Twenty miles from the city you can always see the Parliament buildings.

In Toronto we have a waterfront question. That is the principal thing we have at the present time.

The waterfront question is a railroad question and is really I think a relic of the past when the railroad and the shipping were of equal importance and worked together. I am afraid the only comfort we can take for the present, in this matter, is the understanding that the waterfront trouble has the live standing of a question. The waterfront has gone wrong, and the question is whether we can do anything to set it right. The more we think about the waterfront question, the more likely we are to find a solution for it. So let us hold to it that it is a question, a question for the future.

Everything that I have thought about in this lecture has brought more clearly to my mind the conviction that the movement the Guild of Civic Art is making, to have a plan of the city made for building to in the future, is a move in the right direction and is necessary.

The suburbs of continental cities, especially in Germany, in past years have been laid out by competition. The city makes terms with the owners of property according to the accepted plan. That is to say, the designers have a perfectly free hand about laying out the suburbs. I understand that results justify the method. The great point for us at present is not to lose chances for the future. Another point that we are all troubled over is the want of security or stability in investments in real estate and building. Nobody dare put up a decent house in any part of the city, because no one knows how soon the function of that part of the city will be moved away to another part. We cannot trust any neighborhood to remain of one character longer than twenty years. We do not know when a factory will encroach upon us, or when a tall apartment house will come alongside of our villa.

If a plan were fixed more definitely than now as to the way in which the city was to grow in the future, we would know more about what was to happen in the future and there would be more security in this direction.

Planning is a science, as I have endeavored to indicate, and it cannot be done hap-hazard.

That brings me to discuss the different kinds of city plan. There are three kinds of plan. There is first what is called the Gridiron plan; that is our own plan in Toronto, lines crossing one another at right angles. We have one or two curved streets, and I go by them whenever I can, for the purpose of seeing a curved street. The advantage of this plan is, of course, the simplicity in laying out, and it is said to possess the maximum building space. But our blocks are too large. Look at the great space between King street and Adelaide. They are now beginning to fill that up with factories. There is no reason why there should not through those places go what is very much needed in Toronto, diagonal streets. If we could not make a continuous one, we could I am sure make one that would be practically continuous. There are at present a series of discontinuous diagonal streets made by people who walk across the corners. A certain lot of people who live west come down to town via the lower part of Beverley street They live anywhere northwest but zigzag downwards for the sake of the corner cuts, and strike Beverley street near the bottom for the sake of the corners at the Grange, and the little square behind St. George's church. A gentleman told me that walking down from his house on Beverley street to his office east of Yonge Street, if he took advantage of all the turns, he could save five minutes in his walking. That shows the advantage of going along a diagonal street over going around a right angle. Two sides of a triangle are together greater than the third side.

There is secondly the plan on a ringed basis, as is shown in Vienna. (Here was shown a slide showing the plan of Vienna.) This ringed street is not a very large one. The old town is contained within the Ring Strasse which is a street of fine buildings presenting it is said a more dignified appearance than the streets which are straight. From that street all the other streets lead out. They say that every street car passes all the way around this ringed street and back to its own route, and that Vienna can be filled and emptied in a shorter time than any other city.

Milan, on a smaller scale, shows the same circular arrangement. There is the cathedral in the centre from around which they have pulled down the houses which once surrounded it and have made a fine large square into which all the street cars come.

Paris, you see, gets the same in a more extended form by the internal and external boulevards which surround the city. They are the line of the old fortifications which have been taken advantage of to make circular streets.

There is more than mere convenience in this arrangement. A curved street is a much more beautiful thing than is a straight street, and it is said to have the advantage that it is not so liable to jam. We are not troubled with jams here yet, but they are in the old towns, and to have a curved street is said to be a help to their avoidance.

The third plan is to have diagonal or radiating streets—streets diagonal to a square. It is usually a combination of the gridiron with the diagonal streets running across.

This slide shows the plan of Washington, which is the type of this design. Washington was laid off in advance. It is a specimen of a city which was laid out before it was built. It was laid off by L'Enfant who belonged to the school of landscape gardeners from which such things sprung in France. The city in the main runs with north and south and east and west streets, as are our streets here; but they have in all directions these fine diagonal thoroughfares, which are, of course, of great advantage for convenience in communication. It is also a great thing for air; they can get the winds from every direction brought into the city much more easily than where the streets are only in the two directions. It also gives in these little spaces formed by the intersection of the diagonal streets a motive for a great deal of variety in the building and decoration of the city.

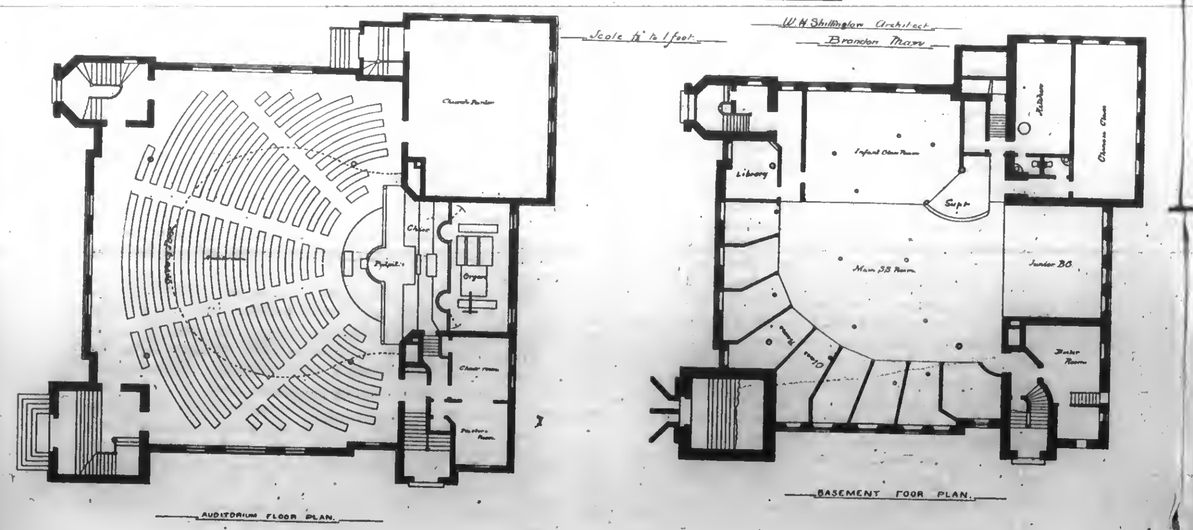
This is a sort of thing which might be superimposed upon Toronto for the benefit of our children. They are doing it in London; in Paris they have found it is not so expensive as one would think it is, because the number of additional frontages created by running a road through the middle of a block makes it partly pay for itself. We lose the frontage that is taken off where the street cuts through, but get instead two quite considerable frontages, so that there is actually more building space and more land to be sold than there was before.

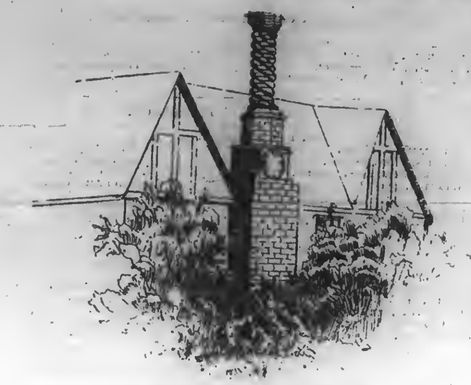
That concludes the general statement of planning, although one might go much further into it, but we have sixty slides to shew.

What I have tried to do is to show that in order to make a city beautiful, you have to attend in the first place to the plan. As far as convenience goes you see the nearer we can make our plan approach to that of a spider's web the better. What he wants is to get from the centre to any point in the shortest possible time. That is what we want, too.

We shall now go on with the slides, which each illustrate some point of plan, and they will be shown in blocks, according to the principle they illustrate.

ST. PAUL'S PRESBYTERIAN CHURCH, BRANDON, MAN.
W. H. Shillinglaw, Architect.





NORTHWEST LETTER.

WINNIPEG, April 5th, 1902.

The cold and the snow of winter have passed away and we are face to face with another building season. The indications are favorable for a prosperous year.

However, the old wage trouble is up again in connection with the carpenters and joiners This year the men have started early so that one of the objections to their action last year has passed away. Now their demands are known before the rush comes on. It is a vexed question, hard to solve in a manner satisfactory to all parties concerned. It admits of many arguments pro and con—points that have been debated and re-debated so many times that they are almost worn threadbare by by this time. The minimum wage of 32 cents per hour is in evidence but in our mind this is not considered by the men the most important point ; the recognition by the contractors of their union seems still to be the strong undercurrent which may carry both sides on to the rocks of disagreement and trouble. While we are willing to acknowledge that the unions are altogether within their rights in banding themselves together for their own protection and the advancement of their trade, we doubt the advisability of trying to force on the contractors the question of the union's recognition. We believe in a good wage for good men, and if in some way the poorer class of men now in the trade could be weeded out and classified as carpenters helpers and paid a fair wage for the work performed, till they could work as good carpenters able to earn for those who employ them a fair equivalent for the wage paid it would in some measure we feel right the matter. It must appear to all that in the long run it pays to employ good workmen and it also pays to pay a good wage to good men—men who will do a fair day's work for a fair day's pay. We look and wish for a closer bond of fellowship and a truer commingling of interests between capital and labor, for their interests are one and the same if looked upon in the right spirit is a spirit of fairness, a spirit of honesty in word and action, a spirit of friendliness and a desire that the interests, monetary and otherwise, should be respected. This may be a high ideal but one which if attained to would end most, if not all the labor disputes of the present day.

The buildings at present proposed are mostly of the better class. This is good evidence of the general prosperity of the community and from an architectural standpoint is most desirable, as architects in this country are so bound down to the lowest cost that there is very little opportunity to work in good good detail and ornament.

There is room in this city for a good modern house at a medium rent. As a rule rents are high, and what the average man requires is a comfortable house not too far from the centre of the city and at a rent which could be paid out of a moderate salary. To the capitalist who will put up such houses and solve the high rent problem there is certainty of a good return on the investment. The house must be warmly built, but while this is called a cold country we maintain that the amount of fuel if judiciously used should not exceed the amount used in Ontario, because as a rule we build much warmer.

A measure of great importance to the architectural profession in this city and province has for a time at least been shelved by the Legislature. The civil engineers and architects of the city and province proposed to form an Engineering and Architectural Institute and for this purpose had applied to the local Legislature for a charter of incorporation. The bill met with much opposition from various quarters. The Dominion land surveyors gave strong opposition. They being a close society objected to the civil engineers having certain powers as to surveys and plans which they said were exclusively their own, or in other words they had obtained a good thing from the Legislature many years ago and were determined to hold it if possible. Vested rights w a the cry, and in some measure this cry prevailed.

The section referring to the architects met with perhaps greater opposition, and from quarters least expected. The architects have proposed to regulate the entrance into the Province o foreign plans and to confine the preparation of plans and designs to all practicing as architects in the city or province at the present time, or who might register as architects within six months after the passing of the Bill. A provision was also made for an entrance examination for all wishing to enter and practice after the six months.

The intention of the Bill was to try and raise the standard of the profession, and throw around it such safeguards as would be beneficial to the general public, as well as the architects. To do this requires a certain amount of protection which can only be obtained through legislation. It was thought the Bill would lay the foundation on which architecture might be gradually raised to a position of prominence in our Province, but the benefits would accrue not so much at the present time as in the years to come. Such were the ideas of those who backed up the measure.

The labor party blindly opposed it on the so called ground of monopoly—a strange and inconsistent stand for the party to take, as their very existence is based on a general monopoly with a tyrannical clause incorporated therein. It seems strange that they cannot see that to raise the standard of architecture, would mean at the same time advancing their own trade interests. In no way would it interfere with them.

Another party strong in opposition (and least expected) was the local Builders' Exchange. Their opposition seems to have been taken from a selfish stand-point. It would appear that they wish to draw plans or have them drawn, then put in tenders for work and execute it without inspection, and so monopolize the whole, a good thing for them perhaps, but not to the best interest of the owner or the general public. They stated that the Building By-law (so-called) safe-guarded the public interests without the assistance of qualified inspection, &c., but like most By-laws of this nature drawn up by those not fitted for the work, one can make anything out of it, and its provisions may be carried out or not as influence may direct.

The above was part of the opposition which the Bill received, and while it passed through the committee stage with some amendments, it was thrown out in the House. We trust in the near future it may appear again, and may then receive fair treatment at the hands of the members. In the meantime it has started the ball rolling, and aroused we trust among the architects of the Province, a general desire to see the profession placed on a good basis and receive at the same time a fair amount of legislative protection.

ST. PAUL'S PRESBYTERIAN CHURCH, BRANDON, ONT.

This church, illustrations and plans of which are given on preceding page, was designed and erected last year under the direction of Mr. W. H. Shillinglaw, architect, of Brandon, Man. The basement is constructed of local field stone and the superstructure of white brick with Bedford limestone trimmings. The auditorium, including gallery, has a seating capacity of 1,000, and the Sunday school in the basement of 500. The building is heated by steam on the direct indirect system. The total cost was $40,000.

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At the last weekly meeting of the Toronto Chapter of Architects, Mr. E. Burke was re-elected president, and Mr. Moore, secretary.

Equal parts of pure red lead and powdered glass with equa parts of albuminized and boiled linseed oil as a medium, is considered to be one of the best anti-corrosive paints.

—THE—

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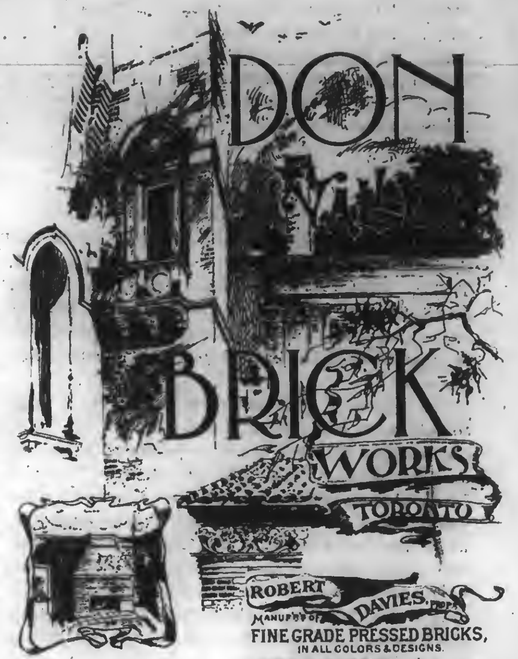

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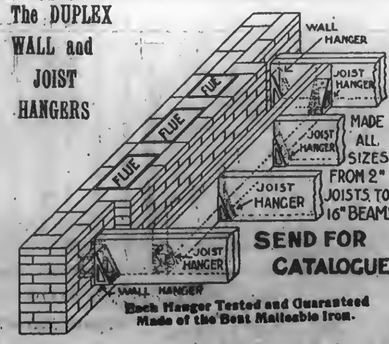

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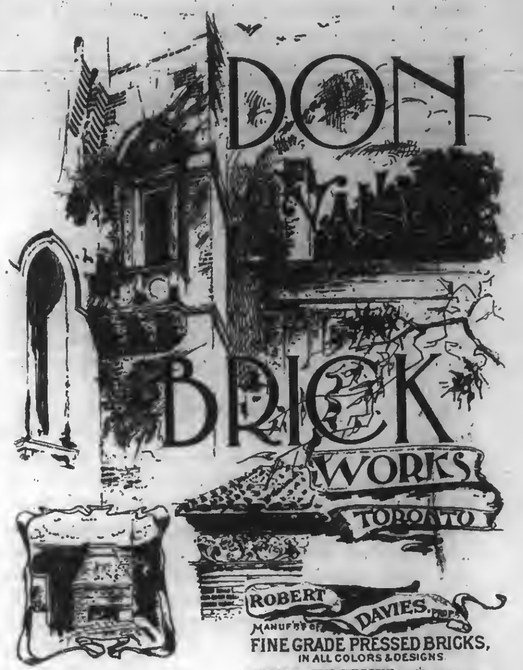

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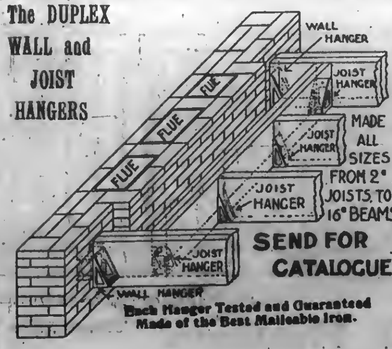

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LESSONS OF THE PARK AVENUE HOTEL FIRE.

The recent fire in the Park Avenue Hotel, New York, caused but little damage to the building, which proved to be a good example of fireproof construction. The floors were of iron and brick, the partitions of brick and the elevators and stairways enclosed in brick walls. The fire was confined to the main hall. A sad feature of the occurrence, however, is the fact that several persons were snffocated by the smoke which entered their rooms from the halls and stairways through the crevices around the transoms and doorways. This is a new phase of the fireproofing problem to which attention must be given in the future.

MOUNT ROYAL CREMATORIUM.

The Mount Royal Crematorium, Montreal, built from the designs and under the superintendence of Andrew T. Taylor, F. R. I. B. A., architect, Montreal, is now completed. So far as known this is the first building of the kind to be erected in Canada. The crematorium is situated to the left of the entrance of Mount Royal Cemetery.

The gateway and the porch lead to a large conservatory hall, about 81 x 42 feet inside. The conservatory will serve a double purpose. It will be used as a waiting hall for the crematorium, and also for the winter vaults, which are located beyond. From this conservatory a door leads into an ante-room, from which another leads into the crematorium proper. This latter consists of two portions, a waiting hall and a chamber in which the incinerators are placed. The conservatory has a high glass roof, with ornamental iron trusses, and a floor of mosaic marble, and will be kept well filled with flowers. The crematorium proper is lined with marble. It has an arched roof and and windows, fitted with leaded lights. A portion of of it is lined with white tiles. The idea is to make the whole pleasing and attractive without extravagance or over ornamentation.

The style of the building is Gothic. Montreal limestone is used for the walls. The doors are of oak. The conservatory has large plate glass windows. The building will be heated by hot water pipes. The incinerators are of the most modern arrangement. Room for four incinerators have been allowed, but two only are built at present.

NOTES.

Mr. Henry Martin, A. R. C. A., who has of late given special attention to the painting of architectural subjects, has on view at Matthews' Gallery in Toronto, an interesting collection of water colors of his character.

A by-law of the London County Council enacts that no house, building or other erection shall be erected upon any site or portion of any site which shall have been filled up with dust or other refuse, or in or upon which any such matter shall have been deposited unless and until such refuse shall have been properly removed by excavation or otherwise from such site.

The following are the names of the successful candidates in Architectural Drawing and Building Construction at the recent closing examinations of The Toronto Technical School. Class 1.—I. Ritchie, W. H. Martin, A. Boissoneau, W. Young, G. Skinner, R. J. Webb, F. Markham, H. J. Baker, S. Young, A. Harriman. Class 2.—A. Fisher, A. R. Boyle, F. W. Robinson, H. Anthony. Pass—F. Essex, W. J. Randall, A. P. Allan, Leslie Price.

The Inland Architect has commenced the publication of a series of notes by architects in general practice in the United States, showing the cost per cubic foot of different kinds of buildings. Messrs Janney and Mundie report the cost of a number of fire proof buildings in which iron and steel construction was employed. The figures cover a wide range from 7 4-10 cents per cubic foot for a warehouse and manufacturing building, and 10 1-5 cents for stables, to 17 1-5 cents for an apartment building, and 20 cents to 57¼ cents for office buildings.

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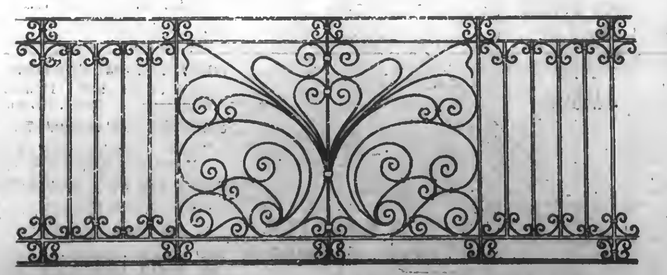

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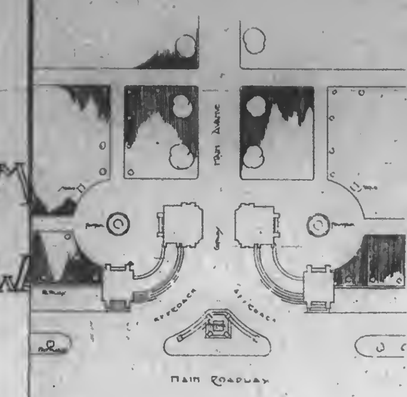

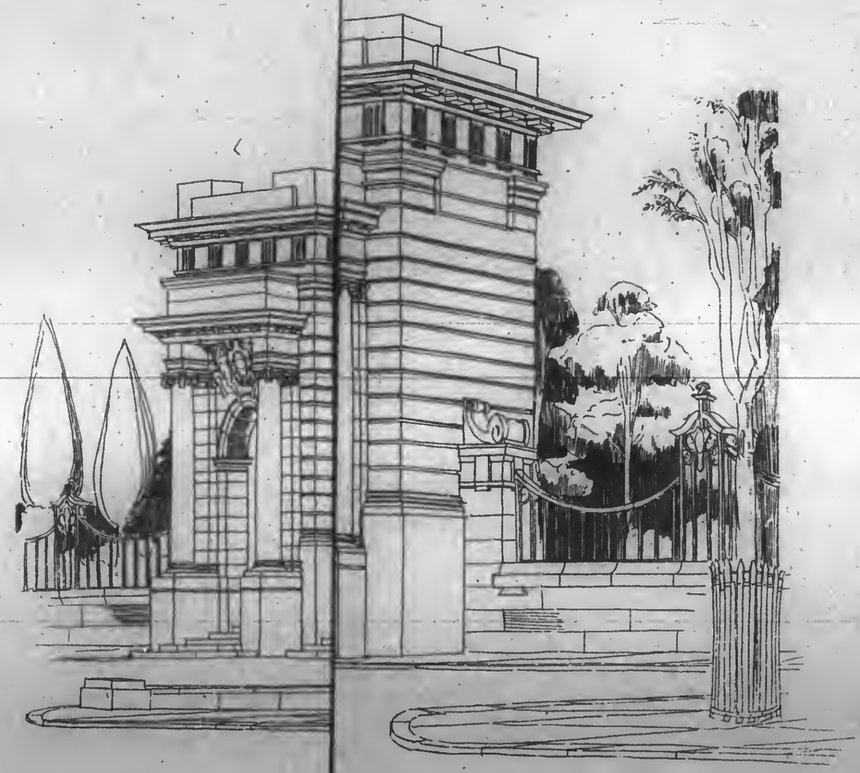

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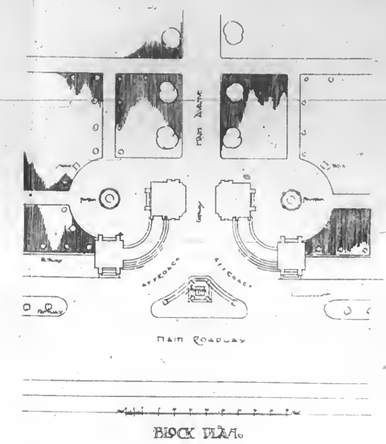
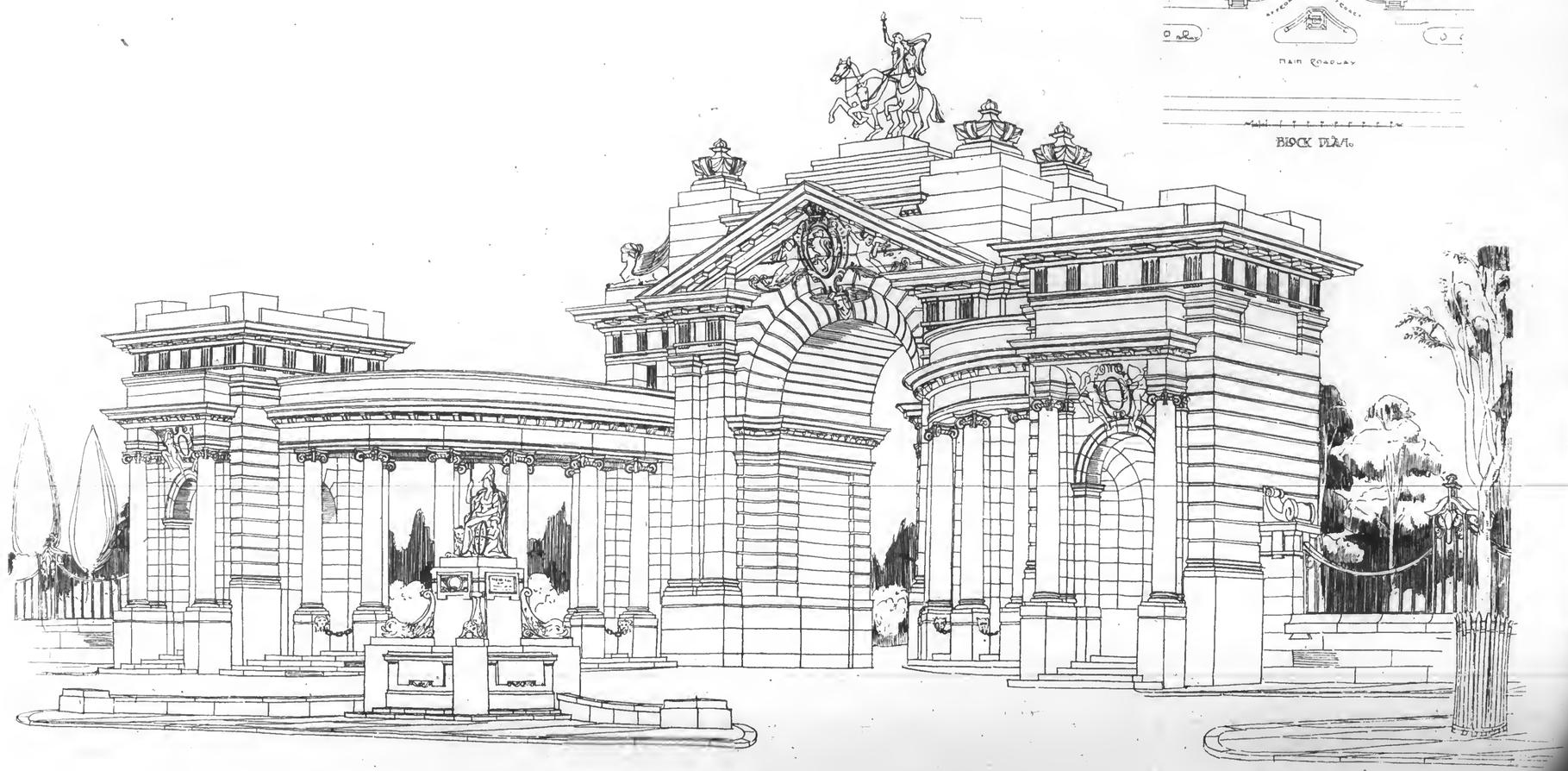


BLOCK PLAN.



DESIGN SUBMITTED BY MESSRS. THOMAS McLAREN AND ANDREW SHARP, A.R.I.B.A.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
APRIL, 1902

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ROYAL LIFE INSURANCE BUILDING, MONTREAL.

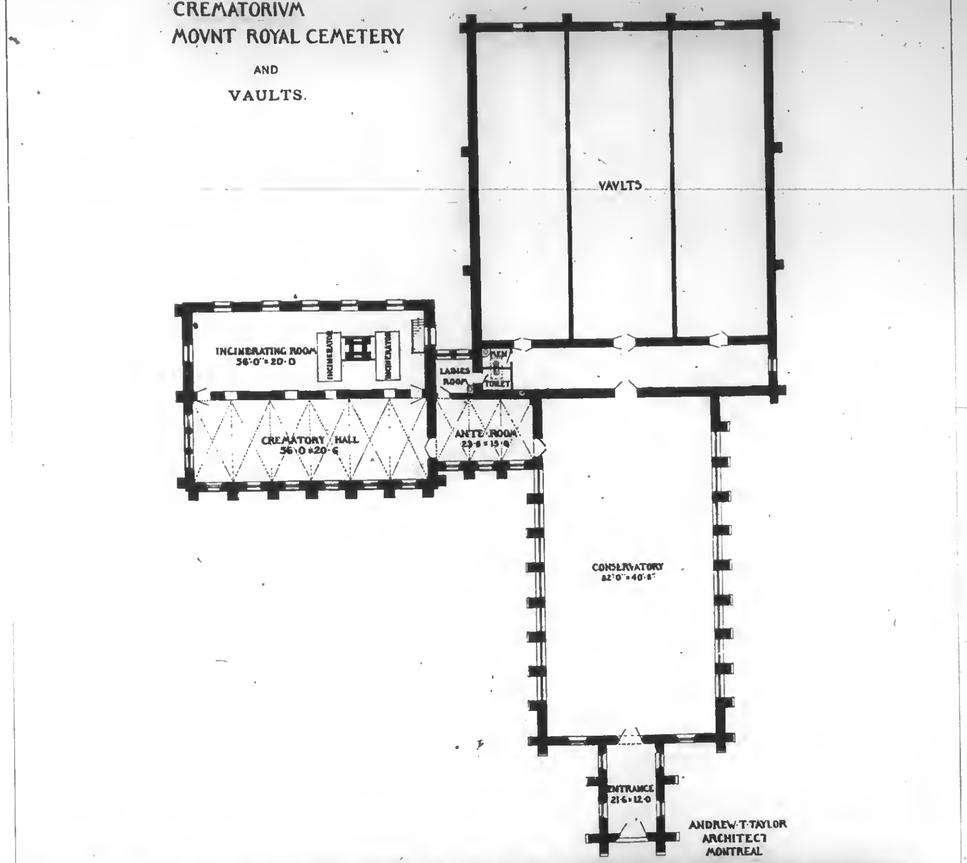
HUTCHISON & WOOD, ARCHITECTS.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
APRIL, 1902

PHYSICIAN'S OFFICE AND RESIDENCE, COLLEGE STREET, TORONTO.

BEAUMONT JARVIS, ARCHITECT.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
APRIL, 1902



GROUND PLAN AND CREMATORY HALL OF CONSERVATORY AND CREMATORIUM, MOUNT ROYAL CEMETERY, MONTREAL.
A. T. TAYLOR, F.R.I.B.A., ARCHITECT.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
APRIL, 1902

CONSERVATORY AND CREMATORIUM, MOUNT ROYAL CEMETERY, MONTREAL.
A. T. TAYLOR, F.R.I.B.A., ARCHITECT.

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APRIL, 1902

The Canadian Architect and Builder

VOL. XV.—NO. 173. MAY, 1902.

ILLUSTRATIONS ON SHEETS.

House and Stable at Wenham, Mass.—Wm. G. Rantoul, architect.
Interior.—By G. S. Lemasnie.

ILLUSTRATIONS IN TEXT.

Portion of Chimney Hood.—Designed and Executed by the Elliott & Son Co., Toronto.
Cottage for Wm. Wadds, Esq., Rossland, B.C.—John T. Honeyman, architect.
Wesley Methodist Church, Vancouver, B.C.—Wm. Blackmore & Sons, architects.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Photogravure Plate.—St. Michael's Cathedral, Toronto.—W. T. Thomas, architect.
Residence of Lieut.-Col. Pellatt, Sherbourne St., Toronto.—Beaumont Jarvis, architect.
Designs for Furniture.—By G. S. Lemasnie.
Porta Delta Carta, Doges Palace, Venice.—By W. A. Delano, New York.

CONTENTS

Editorial	57-58	Decoration	63
A Study of the Basis of Professional Etiquette	59	Church of St. Jean, Montmartre	63
By the Way	60	The Use of Portland Cement	63
Architectural League of America	61	Correction	64
Wind Velocities at Various Heights	61	Architectural Exhibition	64
The Protection of Buildings Against Lightning	62	Legal	64
Fireproof Construction and the Fire Loss	62	Loads and Working Stresses for Building Work	66
Concerning Stained Glass	63		

SPECIAL CONTRIBUTORS.

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" S. H. TOWNSEND, " "
" FREDERICK G. TODD, Landscape Architect, Montreal.
" W. H. ELLIOTT, of Messrs. Elliott & Son Co., Toronto.
" J. C. B. HORWOOD, Architect, Toronto.
" A. F. DUNLOP, R.C.A., Architect, Montreal

Fire Resisting Construction.

The Royal Insurance Company, of Liverpool, has had printed and circulated a form of specification for rendering buildings less liable to destruction by fire. It provides that buildings shall not exceed 80 feet in height. Above the ground floor glass is to be ¼ inch thick in sections not larger that 2 square feet. In the case of wired glass sections are to be not less than 4 square feet. For external wal's, brick terra cotta and concrete are to be used. Stone may be employed as facing when backed by not less than 13 inches of brick. On buildings constructed in accordance with this specification, the Company will make a reduction in their rates.

Spruce Lath.

THERE is said to exist a slight prejudice against the use of spruce lath on the ground that sometimes they discolor the plaster. Recent inquiries from leading contractors in the Maritime Provinces would seem to disprove this contention. Messrs. B. Mooney & Sons, of St. John, write that they have never seen any stain or discoloration from spruce laths, and that, when clear of sap and wane, they give good satisfaction. In the eastern markets, including Boston, New York, and Philadelphia, spruce laths made from slab stock bring higher prices than any other. It is claimed that pine laths containing knots or balsam will discolor the plaster, whereas this drawback is not met with in the case of spruce. As the merits of spruce laths become more generally known a greater demand for them will develop.

The Decay of Stone

Alarm has been caused the citizens of Glasgow by the discovery that the stone work and especlally the costly carving on the minicipal huildings is showing marks of rapid decay. The buildings were erected but a few years ago at a cost of about $2,500,000, stone from a newly opened Bannockburn quarry being used. As a test of the stone it was allowed to lie for a year in the builder's yard before being placed in the building. Although it stood this test satisfactorily, it began to decay in situ. The reason has not been discovered. Much older buildings in the same locallty are in a good state of preservation. Instead of cutting out whole capitals of pilasters, as was at one time proposed, only the decayed portions are being cut away and a silicate solution applied for purposes of preservation. £600 has already been expended on this work.

Dangers of Steel Construction.

General Sooysmith, head of one of the most prominent contracting firms in the United States, in a recent address before the Chicago Real Estate Association predicted

the early collapse of many of the tall buildings of that city in which imperfect steel construction has been employed. In the earlier buildings of this class, the steel framework instead of being imbedded in concrete, was simply cased with stone or brickwork, leaving crevices through which moisture might enter and corrode the metal. Under such conditions corrosion proceeds very rapidly, and the corrosion of one fifth of the substance of the metal of a supporting member at any given point, would in general, cause its failure. In view of General Snoysmith's warning it is urged that an immediate examination should be quietly made of buildings of the class to which he has referred, and measures taken to prevent an accident which would involve loss of life and so weaken public confidence in the stability of such structures as to seriously depreciate their value. Such an examination would also be likely to disclose facts of which architects should be possessed.

Reform in Architectural Competitions

By request of a number of prominent British architects, the Royal Institute will appoint a special committee to receive suggestions and formulate a plan whereby necessary reforms may be effected in the method of conducting competitions. In view of the unsatisfactory results of several important competitions held recently in England, the conclusion has been reached that in undertakings of a technical or complicated nature more than one referee is required. It is suggested that in such cases there should be two—one to be chosen because of undoubted ability as a designer the other for his special knowledge of the particular problem to be considered. In case these two should be unable to agree to an award it is proposed that they be empowered to elect a third architect as umpire. It is suggested that a list of architects in whom competitors have confidence be supplied to the president of the Institute, from which list a choice of referees could be made. It is urged that in cases where the promoter of a competition fails from any cause to carry out the undertaking it should be agreed that a substantial money payment should be made to the author of the selected design on about the same scale as if he has been commissioned direct to prepare plans without any competition.

Labor Conditions.

THE opening of the building season this year has been marked by more than the usual number of strikes embracing bricklayers, carpenters, painters, plumbers, and last of all the architectural structural ironworkers. Most of the disputes have been adjusted for the present season at least on a compromise basis, without much loss of time. The higher standard of wages which has been fixed in the various trades, has blocked quite a large percentage of building projects which would otherwise have gone forward this season. As an example a contractor who submitted tenders for four buildings states that only one of the four was proceeded with on account of the tenders being too high. The opinion prevails that the ever increasing demands of the unions for higher pay and shorter working hours, coupled with other restrictions almost too numerous to mention, will prove to be one of the most potent influences in bringing to an end the present period of prosperity. The broadening of the franchise has placed great political power in the hands of the labor leaders, which they have not been slow to exercise. As a result legislative bodies are pandering to them as never before, and are in danger of losing sight of the national welfare, which demands equal justice to all classes and the protection of capital as well as labor. It should not be forgotten that the interests of both are indentical and that any advantage given the one over the other can only be temporary. We should take warning by the experience of our sister colonies of Australia where the results of the labor laws are thus described in a letter by Mr. D. H. Ross, a Canadian, to Sir Richard Cartwright, Dominion Minister of Trade and Commerce: "The labor laws throughout the Commonwealth and New Zealand are of such character that the careful business man or capitalist seeking an investment would hesitate indefinitely before placing his business and capital under the sole control of the labor unions, which are so strong at the present time that they practically hold the balance of political power, and throw in their support with either party, Government or Opposition, which will agree to carry out their so-called labor reforms. A manufacturer's business is under their control to the extent that they dictate its policy, the number of employees permitted, the number of apprentices, their hours of labor, their rate of wages, their days of vacation, how the factory shall be lighted and ventilated, and so on, ad lib. Owing to these tyrannical labor laws, boot manufactures in Melbourne, who, previous to the federal tariff were protected to the extent of $1.20 per pair on men's boots, were scarcely able to make both ends meet. In Wellington, N.Z., it was recently stated that a large boot manufacturer there had decided to close his factory and become an importer, and boot operatives have recently arrived here from New Zealand looking for employment."

The Coronation Stone.

THE near approach of the coronation of King Edward the VII lends interest to the following particulars regarding the history of the famous coronation stone: That this stone was formerly in use in Ireland for the Coronation ceremony, that it found its way into Scotland—certainly earlier than the reign of King Kenneth, 834—that it was then removed to the Abbey of Scone, where for 450 years all the kings of Scotland were crowned upon it, and that it was brought to England by King Edward I. in 1296 after John Baliol, the Scottish King, had been defeated at Dunbar, are well ascertained historic events. There used to be a tradition that the stone was of meteoric origin, but Dean Stanley settled this matter when in his "Memorials of Westminster Abbey" he included a paper written by Professor Ramsay, called "A Geological Account of the Coronation Stone," in which it is said: "The stone is a dull reddish or purplish sandstone, strongly resembling that of the doorway of Dunstaffnage Castle, which was probably built of the stone of the neighbourhood. It is extremely improbable that it was derived from the rocks of the hill of Tara, from whence it is said to have been transported to Scotland, neither could it have been taken from the rocks of Iona. That it belonged originally to the rocks round Bethel is equally unlikely, while Egypt is not known to furnish any strata similar to the red sandstone of the Coronation Stone."

PORTION OF CHIMNEY HOOD FOR DRAWING ROOM IN RESIDENCE OF MR. F. B. FETHERSTONHAUGH, DESIGNED AND EXECUTED BY THE ELLIOTT & SON CO., TORONTO.

A STUDY OF THE BASIS OF PROFESSIONAL ETIQUETTE.

Not long ago a speaker, at one of the English architectural meetings, spoke in a congratulatory way of the time being past when a leader of the profession (the allusion was evidently to Sir Gilbert Scott) would go about with a portfolio of churches under his arm, to call on building committees. On the other hand, we hear that in the United States, nobody dare wait for a job to come to him; that Michael Angelo himself, if he lived in Chicago or New York, would have to hustle for work. Which of these two tendencies is in the direction of progress?

What is all this hustling about? What is there about hustling that should recommend it to clients? The hustler is not hustling for his client's interest but for his own. A scholarly designer like Sir Gilbert Scott must have been a very high-class hustler. His kind of work implied personal attention to it. Yet there is a story of his going to a church opening, and, as he was being driven up to the church, turning pale and whispering to his confidential clerk, who was with him, "They have got the wrong church."

The typical hustler works *for* work not *at* it, and what the client wants is some one who will work *at* his work.

Of course the hustler works at his client's work in the sense of getting it through. He must have a good staff. That is partly what he is hustling about. It almost seems sometimes as if there is a point of view from which it is the staff which may be said to have a hustler, who spends his time upon the street to find work enough to pay them. Staff work, in fact, is the result of this system.

There is a certain medium class of commercial work for which staff work does well enough, and a certain class of client to whom it is a satisfaction to feel that his work is being handled in what he would call a business like manner; i. e. put through without fuss, in the shortest possible time, and looking when done like other new buildings of its kind. As a matter of fact the work is done in a business like manner. Let us give the style of practice all the credit that is due to it, in the best examples. The architect runs a plan factory. It has factory merits and factory defects. The merits are certainly a comfort to a client whose interest in his building is commercial; and the defects do not matter much from his point of view. But how about delivering over the whole field of architecture to this system? It is bound to result in staff architecture, that is to say in factory architecture; and factory architecture is not good enough for good work. Any body who knows what real planning is like will know that the case of Sir Gilbert Scott will be often repeated in a metaphorical sense. The right problem may be under consideration but the wrong plan will be produced. It is true that H. H. Richardson did not draw himself, but his mind was on design all the time; he was devoted entirely to his work. It is true on the other hand that Mr. Ernest George (as he stated when receiving his R.I.B.A. gold medal) does nothing else but draw. He represents, that is to say, the possibility of a first-class man taking care of the design, while some one else gets the work and attends to the business connected with it. But Mr. George is as exceptional in his way as Richardson was. Under ordinary circumstances, if work has to be worked for, the big man of the concern will be devoted to that, as indeed he is now, and the architectural level must fall. That is bad for architecture, but what we are concerned with just now is that it is bad for the owner of architecture—the client. If this estimate of the consequences of hustling is sound, clients have no cause to smile upon the practice.

How about the architects themselves? The profession professedly abhors the practice; and, at the end of the tariffs of fees, there is a clause defining professional etiquette in a way that practically excludes work hunting. But there commonly is a jocular way of speaking about the practice that implies uncertainty of purpose. At the bottom of this is uncertainty about the moral basis, a feeling that perhaps the new is the true and that old fashioned scruples are perhaps old fashioned for cause, like horsecars and the old, old systems of fifteen years ago. Morals however do not change. A gentleman is the same now as he was in

the days of "the grand old gardener and his wife", and as he will be when he walks the golden street of the new Jerusalem. It is this permanent quality of honour that attracts the regard of the architectural profession. The superficial points in professional etiquette may change; ideas of professional dignity may change; ideas of remuneration may change; the basis of these is not too deep for ioking; but the matter of getting work is.

The truth seems to be that there is only one way of getting work that is right, and that is that an architect should always do his best work: put his best goods upon the market, that is to say, and let them speak for him.

It is a hard condition, for growth from small to large work may be slow. People who employ an architect for important work, like to see something that he has done of the same kind. "We judge ourselves by what we think we can do, but others judge us by what we have done," is a maxim which exactly fits the case of the young architect and states his difficulty. Competition (a question by itself) is accepted as a means of making a rapid step between small work and large. But, competitions or not, the step is sure to come in time to the really able, and usually before long; so that, though, like all other right conduct, some patience and faith and self-government are implied, the condition, though severe, is not more than a man should accept.

Why is this the condition of honourable practice? Because the moment a man reaches out for work he is reaching out for somebody else's work. If the work would not naturally come to him, it would naturally go to someone else. He reaches out for it; uses a "pull," asks, persuades, or merely works the magnetism of his personal presence—highly magnetized for the occasion—and the deed is done; he has knifed a neighbour.

This is the bottom fact that makes the profession uneasy about going about to get work. It is the disregard of others that is the dividing line between honourable and dishonourable practice. When another architect is already engaged, it is easy to recognize that he has rights and the better members of the profession are strict about not interfering there. It is a more uncertain state of affairs when work is in the air, and seems to be only waiting to be grasped. It is agony not to grasp it, but there is always a sense of shame before other members of the profession in doing so—and is not this the cause, that it has to be taken from some other member of the profession. If it is our's we may wait for it; if it is not our's whose is it? Somebody else's. Then for "taken from some other member of the profession", we may read, "stolen from some other member of the profession". It seems strange that men should think their duty to their wife and family obliges them to steal from some other man's wife and family. And this in a Christian land. Surely before we adopt the (reputed) American practice we should pause to think where we are going.

W. A. LANGTON.

The most magnificent work of architecture is the Taj Mahal, in Agra, Hindustan. It is octagonal in form, of pure white marble, inlaid with every sort of precious stone. The work took 22,000 men 20 years to complete, and though there were numerous gifts and the labour was free, the cost was £3,200,000.

BY THE WAY.

In view of the injury sustained by several persons by the recent fall of a balcony in London, the Builder suggests that District Surveyors should be instructed to examine balconies on streets through which processions will pass during the coronation ceremonies.

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I am interested to learn by what standard candidates for membership in the Ontario Society of artists are judged? A certain amateur artist was asked by the society to allow some of his works to be hung at the recent exhibition. His pictures attracted favorable notice and several of them were sold, yet I am told the artist was refused admission to membership in the society.

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The death of a man who recently fell over the stair railing in the City Hall, Toronto, has called attention to the proper height for such railings. The coroner's jury appointed to enquire into the cause of the accident returned a verdict of accidental death, but expressed the opinion that the railing was too low, and to insure safety should be made higher. On the contrary the architect of the building, Mr. E. J. Lennox, states that the railing corresponds to what has always been regarded as the standard height, namely 2 feet 6 inches. The matter is one which architects would do well to enquire into, lest some day they find themselves in the position of defendant in an action for damages.

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A young architect came to me the other day with a grievance which I am sure is shared by many citizens of Toronto. He had been out with his camera with the purpose of getting pictures of some of the best examples of domestic architecture in Rosedale, the annex, and other residential districts. In almost every instance he found a telephone or electric light pole, a real estate agent's sign or some such disfigurement so placed as to make it impossible to secure a satisfactory photograph. There is little encouragement given the citizens to build tastefully so long as unsightly poles and signs can be planted in front of their doors. It is time that the telephone company should follow the example of the electric light company which of late, in the best residential localities, has been steadily putting its wires underground.

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The property owners on Spadina Crescent, in one of the principal residential districts of Toronto, recently made the discovery that a livery stable was to be established in their midst. When they had set about getting up a petition to the Council, they learned that the limit of time allowed for filing a protest had expired. They are consequently without redress. This is but another instance of the hardship to which property owners are subjected because of the defective character of the city building by-laws. Owners of property should not be required to be constantly on the watch against encroachments upon their rights. The by-laws of the city should afford them protection. Under the existing by-laws, factories and other objectionable buildings can be erected anywhere, regardless of their effect on the beauty of the locality and the value of surrounding property.

ARCHITECTURAL LEAGUE OF AMERICA.

The fourth annual convention of the Architectural League of America will be held in Toronto on the 29th, 30th and 31st inst. About fifty delegates are expected. The League was originally organized to facilitate club work and exhibitions, but has since broadened its field. The principal topics of discussion this year will be Architectural Education and Municipal Improvement.

The Toronto Architectural Eighteen Club, being hosts of the occasion, are holding their annual Exhibition open until after the convention and also arranging to show the delegates and their friends around the city and give an entertainment on the last evening of the convention.

The draft programme for the convention, which of course is in some degree subject subject to change, is as follows:

THURSDAY, MAY 29th.

9 a.m.—Meeting of the Executive Board at the Queen's Hotel,
9 a.m.—Registration of delegates, alternates and visitors at the Ontario Society of Artists' Galleries.
10 a.m.—Calling to order of first meeting by President of Toronto Architectural Eighteen Club.
A.—Roll call of representatives.
B.—Appointment of Committee three on Records and Publicity.
C.—Election of Speaker and Secretary of Convention.
D.—Election of two auditors to examine and report upon the Treasurer's accounts.
E.—Reading of Communications.
F.—Annual Report of Executive Board.
G.—Treasurer's Report.
H.—(1) Report of Committee on Publicity and Promotion, Lawrence V. Boyd of Philadelphia, Chairman.
(2) Report of Committee on Code of Ethics and Competitions, Julius F. Harder of New York, Chairman.
(3) Report of Committee on Exhibition Circuit, Walter F. Kleinpell of Chicago, Chairman.
(4) Report of Committee on Foreign Exhibit-Committee not filled.
(5) Report of Committee on Current Club Work, Ernest J. Russell of St. Louis, Chairman.
(6) Report of Committee on Education, Julius F. Harder, of New York, Chairman.

AFTERNOON SESSION.—2 P. M.—Discussion on Educational Questions under the following eight headings set out by the Educational Committee and allotted to the various Clubs:

1.—INTRODUCTORY.—Three functions of the science of education;
(a) The information of knowledge.
(b) The discipline of human faculties.
(c) The nurture of character and individuality.
2.—(d) Is a National American Art University a desirable or necessary institution?
(e) Should the art education of the nation be centralized in one great school, and therefore the present schools be united with such central school, and detach from their present associations with other fields of instructions?
3.—(f) Should the National Government have connection with and jurisdiction over a National art university, or should the organization and control be similar to that now existing in American universities?
(g) Would the artistic growth of the nation reach its highest development without a great National centralized university?
(h) Could the present centers of art education scattered in reference to locality and influence, and developing more or less independently attain to as high a total of efficiency and accomplishment?
4.—(i) Is the time ripe for a great American University of Art?
5.—(j) What should be included in its curriculum?
(k) Should art artisanship, namely, the art-crafts be included?
(l) Should a national university be one primarily for the arts and crafts, and secondarily for the fine arts?
(m) Are the concrete or applied arts superior to the abstract or luxurious arts?
(n) Are the concrete or applied arts entitled to more immediate consideration than the abstract or luxurious arts?
6.—(o) Does architecture belong in the category of the accepted fine arts, or is it more properly related to art craftmanship?
7.—(p) Does the one great centralized national university, or do the many smaller provincial schools exert the stronger and better influence over the studeot body?
(q) Which of the two systems gives the greatest freedom and promise for the development of individuality?
8.—(r) Can a system of self-education by means of club association be permaneotly established?
(s) Is such a system demanded by present conditions?
(t) Would such a system, seriously undertaken, self-supporting, and maintaining itself by methods of self-government, be productive of commensurate results both of quantity and quality?
(u) What should be the plan and scope of such a system of club and inter-club sell education.
(v) Can a connection be established between such a system and the architectural educational institutions?
(w) What should and could be the nature of such a connection?

EVENING SESSION—8.30 p.m.—Municipal Improvement Committee's Report.
Lantern Slides of improvements to City of Washington with lecture on same by Mr. H. K. Bush-Brown of New York, Chairman of this Committee.

FRIDAY, MAY 30TH.

9.30 a.m.—Address on Landscape Architecture by Geo. F. Pentecost, Jr., of New York.
Paper by Frederic Law Olmsted, of Brookline, Mass.
Paper on "Civic Aesthetics" by Charles Mulford Robinson, of Rochester, N. Y.
2.30 p.m.—Sail on Lake Ontario. Group photograph in front of Toronto University.
EVENING SESSION—8.30 p.m.—Lecture on Mural Decoration by H. B. Pennell, of Boston.
Lecture on Municipal Improvement at the St. Louis Exhibition, by Albert Kelsey.

SATURDAY, MAY 31ST.

9.30 a.m.—Address on "Architectural Practice in America", by Dwight Heald Perkins, of Chicago.
AFTERNOON SESSION—2 p. m.—(K) Unfinished business and new business. (L) Appointment of Standing Committees. (M) Election of President of League and place of the Executive Board. (N) Designation of place of next Annual Convention. (O) Adjournment.
EVENING SESSION—8.00 p. m.—Banquet or Smoker and programme of entertainment.

WIND VELOCITIES AT VARIOUS HEIGHTS.

From photographs and measurements of the waterspout seen off Cottage City, Mass., in August, 1896, Prof. Bigelow has recently calculated the wind velocities, etc., as follows, in miles per hour:

Height above Sea Level. Feet.	Diameter of Tube. Feet.	Velocity of Rotation. Miles.	Vertical Upward Velocity. Miles.
4,193	[illegible]	14.1	0.04
3,901	506	94.4	2.50
2,999	250	189.0	9.90
1,802	178	268.0	19.80
1,201	158	300.0	24.70
479	144	333.0	29.70
0	134	354.0	34.60

Dimensions and velocities like these characterize the largest tornado tubes and, together with the fall of internal pressure by the amount of three or four inches, readily explain destructive efforts such as those observed at Louisville and St. Louis recently.

The Council of the Royal Victorian Institute of Architects have adopted a scheme for a course in architecture, and cognate subjects to suit the requirements of articled pupils. The course will take three years at three nights per week, and the subjects will include architectural drawing, lectures, including sanitation, gas, water supply, quantities, and strength of materials, practical, plane, and solid geometry, and applied mechanics.

THE PROTECTION OF BUILDINGS AGAINST LIGHTNING

A paper of much practical value on this subject was recently presented by Prof. Reynolds, of the Ontario Agricultural College, Guelph, before the Mutual Underwriters' Association of Ontario. The author showed that trees, especially those with pointed tops such as poplars, elms and pines, being good conductors, act as protectors of nearby buildings. To the presence of trees in the streets he attributes the great exemption from damage by lightning of building in towns and cities as compared with country districts. In the country, owing to the cutting down of the trees, the damage by lightning is greater than 50 or even 30 years ago. Trees should however, not be too close to the buildings to be protected—not nearer than from 10 to 20 feet—as otherwise there is danger of a side flash from a tree striking the building and causing damage.

"There is perhaps, no tree which is a more efficient protector against lightning than the spruce used for ornamental hedges; that is just the thing for the purpose. This forms a natural protector against lightning. It is always in repair, and lasts practically for all time, and besides being a means of protection, its natural beauty adds to the permanent value of the property on which it is grown."

As regards artificial means of protection Prof. Reynolds recommended lightning rods, provided they were made of proper material, in proper form and rightly put up. If these conditions were not observed they became a source of danger instead of a protection. Copper conductors should be used weighing eight ounces to the foot, in flat form and attached to the building by proper insulators. In the opinion of the author the more points extending upwards from the conductor, the better. These points should be five or six feet high, and not more than 40 feet apart. It is essential that they be bright and sharp, as a bright point seems to have more attraction for lightning than a dull one. Aluminum is recommended as a material for points, because that material will not rust; it is always bright, and is a better conductor than iron.

"One of the most important points of all in providing for this sort of protection is in having a proper ground connection. It is an easy matter for a careless or dishonest agent to put the ground wire just a little below the surface; it is then out of sight, and he thinks out of mind as well. Wire buried just below the surface, in dry ground so far from being a means of protection, is a cause of danger, because the lightning, attracted by the points on the roof, is carried down the conductor, and if it is not then dissipated in damp ground, it is apt to fly off into the building. Protection can be ensured by seeing that the ground wire is connected with earth which is always moist. The depth necessary will depend upon the character of the soil and the location of the building. It may not be necessary to go over three feet, or it may be necessary to go ten feet; what is imperative is that the ground wire shall be connected with soil that is never dry. To this end it is best to put the ground wire in during dry weather. It is necessary to have more than a single wire in the ground. It is required to take such measures as will provide for the distribution of the current at the bottom. This can be provided for by flattening out an old copper boiler in sheet form and soldering that to ground wire; or take a number of stands of barb wire and connect these with the ground wire below the surface.

In the opinion of Prof. Reynolds the rodding of a building should be the subject of inspection at the time that the work is done, and provision should be made for periodical inspection after the rodding. Where this is done, there should be given something in the way of preferential rates to those who take this means of protection.

Sixty- five per cent. of the buildings struck in Ontario last year were barns. Of the buildings struck and burned, 80 per cent. were barns, one reason for this no doubt being that barns are nearly all frame, while many house are of brick or stone.

FIREPROOF CONSTRUCTION AND THE FIRE LOSS.

An appeal has been issued by Mr. Edward Atkinson the well known insurance expert, of Boston, for funds with which to establish an experiment station in the Massachusetts Institute of Technology. Mr. Atkinson has been prompted to take this step by having witnessed while in Europe last year, the benefit resulting from the experiments carried out in London under the direction of the British Fire Prevention Committee, whose work has frequently been referred to in these pages. As President of the Boston Mutual Fire Insurance Co. Mr. Atkinson has given the subject of methods of building construction in relation to fire prevention in textile factories much consideration, and has succeeded in effecting a large reduction in fire losses in such factories. He is now desirous of securing similar results from all classes of buildings.

Regarding the enormous fire loss in the United States, he says: The ash heap of the United States in the year 1901 exceeded one hundred and fifty million dollars ($150,000,000). If to this is added the excess of expense in conducting Insurance Companies, and the expence in water works and fire departments, all mainly due to the existence of avoidable danger in our great cities, we may compute the fire tax of this country in an average year at not less than two hundred and fifty million dollars ($250,000,000), probably more. That sum is more than the normal expense of conducting the United States Government in all its branches, omitting interest and pensions. It is equal to twenty (20) per cent. of the capital which can be added in a good year to the capital of the nation. It is considerably more than the annual appropriation for common schools; more than double the sum annually expended for the support of all our universities, colleges and technical schools, and yet there is no school where the elementary principles of prevention of loss by fire forms any part of the instruction.

In addition to the direct losses sustained by property owners and the insurance companies, enormous loss is inflicted upon the working class who are least able to bear it.

Methods of fire prevention as applied to buildings are deserving of much greater consideration than has thus far been given them on this continent.

An influential deputation, representing the Institute of Architects of New South Wales, recently waited upon the Under Secretary of Works, to impress upon the Government the desirability that designs for public buildings of a national character should, in future, be thrown open to competition.

CONCERNING STAINED GLASS.

In a lecture on this subject, before the Sheffield Society of Architects and Surveyers, Mr. A. Jeffery said that the first stained glass executed in England was in the time of King John. Previous to this all glass came from Italy, which even at this date boasted of eminent artists. The old masters taught us many lessons, and much could be learnt from them. We should try and embrace all the good qualities of the old men, ignore their shortcomings, and try to improve on what had been done before us. After the sixteenth century stained glass died out, and did not again revive until the nineteenth century. Mr. Jeffery went on to explain that a window should be part of a building, and should not be treated as a picture or wall decoration. If a man attempted a picture he spoiled his material as glass and made a very bad picture. As to the different methods of manufacture English glass was superior to foreign, both in material and workmanship. The most important point in a window was permanency, and only the most permanent of colours should be used, at whatever cost. Speaking of domestic glass, he did not think modern style was a passing fancy, but that it had come to stay, but like all other transitions in art at the outset it seemed to have been let loose, and we appeared to be seeking after something we could not quite grasp. The style, however, would ultimately settle down and find its own level. He was eagerly looking forward to the time when there would not be so much commercialism in connection with artistic crafts, and he hoped architects in the near future would come more into contact with the craftsmen, and by their joint ideas succeed in raising the standard of work.

DECORATION.

Lecturing before the Institute of British Decorators, in the Manchester School of Art, on "Decoration: its Methods and Materials," Mr. G. C. Haite remarked that the connection between architecture and decoration was of the greatest importance, and decorators should carefully study their relationship. Unfortunately in many cases of domestic decoration, with which one had to deal, there was no architecture worthy of the name; and to that extent, the decorator had nothing to work upon. There were people who ridiculed the idea of law in decoration. Applied art, however, depended on law. The essential principles, underlying everything else, were fitness and beauty. Decoration was subject to many limitations, and often these limitations conferred positive advantages. Take, for instance, the Moorish prohibition of the imitation of nature. As a result of that, we had the use of many forms showing very beautiful results. The limitations imposed by lines in lead light work were an absolute necessity, yet once recognised, what possibilities arose in their use. In stencilled ornament the fact of having to use ties imposed certain limitations. When properly employed, ties became a very effective part of the ornament. Coming to essentially modern forms of decoration, there appeared to be two schools of thought in existence, one of which would prohibit many examples of manufactured goods, believing that the true sphere of the decorator was in the production of ornament in the flat, and the other recognising that the goods made ready to hand were a product of the time, meeting real needs, and their use, therefore, quite legitimate. The first idea implies that every executant should be a designer, and he was in favor of this, if the men could only be found. We must differentiate, however, between a designer and a house-painter, for design required a master hand. He would urge upon all decorators the desirability of having private designs prepared for them by competent designers.

CHURCH OF ST. JEAN, MONTMARTRE.

The new church of St. Jean, at Montmartre, which is being built to replace the old Church of St. Pierre, adjoining the immense basilica of the Sacre Cœur, has again got into difficulties with the administration, and the Prefet de Police has given orders to the architect to stop the work of construction at once, and to proceed to demolish the building, which is now nearly completed. This church has already attracted considerable attention in architectural and building circles, first on account of the novel style of architecture which M. de Baudot, the well-known Diocesan architect, has given to his design, and again by reason of the nature of its construction, entirely in armoured brick and cement, called the Cottancin system. The Prefet de Police requires the immediate demolition of the church under a penalty of £4 per day of delay, simply because a proper demand for permision to construct was not made by either the architect or the vicar of the parish. The latter, considering that he had the right to build in spite of the Prefet, continued the work. It appears, however, that the Prefet is exceeding his rights, and that the vicar will win the day, for, according to the law relating to building rights, no demand for permission to construct a church on one's own property is necessary. The case is exciting great interest in Paris, for nearly £16,000 of building work has already been done on the church.

THE USE OF PORTLAND CEMENT.

Mr. H. H. Humphreys' in an exhaustive paper presented before the London Architectural Association traced the history of Portland cement and dealt with the question of testing. "The use of concrete in connection with expanded metal or with iron or steel rods has, I believe," said the author, "a great future before it, as the additional strength obtained by the introduction of the metal is vastly in excess of what mere theory would lead us to expect. In Germany and France and the United States this class of work is frequently met with, but up to the present time no very large amount has been carried out in this somewhat conservative country. It is bound to come, however, and considering the condition of what is generally called the 'skilled' labor market, it will be well if some substance (which it is possible to make by unskilled labor) can be subsituted for brickwork, as we may then hear that brick-layers are once more pleased to lay more than 400 or 500 bricks per diem. There may be a drawback, however, in using this armoured concrete, for unless the iron or steel, rods, joists, &c., are thoroughly protected, they will rust with great rapidity, and not only will their own strength rapidly disappear, but in addition to this the expansion of the metal in process of oxidation will cause disruptive forces to be set up in the heart of the work."

Prof. S. H. Capper, delivered an interesting lecture on Westminster Abbey before the members of the Province of Quebec Association of Architects on April 15th.

CORRECTION.

The Pite Competition design for park gate published in the April number of the CANADIAN ARCHITECT AND BUILDER was incorrectly credited to Messrs. Thos. McLaren and Andrew Sharp, A.R.I. B.A., Mr. McLaren's name alone should have been given as being the author of the design.

ARCHITECTURAL EXHIBITION.

The second annual Exhibition of the Toronto Architectural Eighteen Club will be held in the Ontario Society of Artists' galleries from the 19th to 31st inst. It will principally consist of photographs with quite a sprinkling of drawings ; the latter, however, will be a secondary feature of the Exhibition.

An illustrated catalogue will be issued at the opening of the Exhibition and will contain fifty full page illustrations of the most noted exhibits, and will endeavor to, if possible, outdo last year's issue in every respect.

LEGAL.

It is learned by the American Architect that a curious and important case has just been decided by the New York Court of Appeals. Some twelve years ago a block of three apartment houses was built on three contiguous twenty-five foot lots in New York by the owner of the three lots, who made the walls between his houses party walls. Not long ago, one Schaefer contracted to buy one of the lots with the house standing on it. After he had agreed to buy, he learned that the party wall, for a distance of twenty-seven feet, was entirely on the adjoining lot. He sued the person from whom he had agreed to buy for damages on the ground that he had not a complete house on the lot in question, since the support of a portion of the beams was on neighboring property. This view was confirmed by the Supreme Court, but the Court of Appeals held a different opinion, saying that the original owner of the three lots, by resting the beams of one of the houses on what was supposed to be a party wall, but which was really on the adjoining lot, created thereby a servitude on the latter lot, so that Schaefer was thereby entitled to rest his beams on the wall in question as long as it should stand ; and, as his house was so much wider in consequence, he was benefitted rather than injured, by the mistake.

One of the general conditions usually annexed to the articles of agreement between employer and contractor is to the effect that all additions, omissions, or variations made in carrying out the works for which a price may not have been previously agreed upon are to be measured and valued and certified for by the architect, and added to or deducted from the amount of the contract, as the case may be. The failure to insert such a clause says the London Builders' Reporter, resulted in a case being brought to the Chichester County Court on the 12th inst. Mr. H. A. Smith, builder, of Selsey, sued Mrs. S. Dent for the sum of £38 15s. 6d. for work done. The plaintiff contracted to erect a bungalow at Selsey for the sum of £740. While the works were in progress several alterations were made which resulted in the above claim, in addition to £20 already paid for as extras. Among other things, it was stated that plaintiff had to put on fresh grates; that he had to remove a cesspool which had been dug beneath one of the principal bedroom windows; to effect alterations in a gable to the roof and to repair the thatch, which was blown about by gales of wind, and to do certain extra work to chimney flues. Plaintiff's explanation as to the extraordinary situation of the cesspool was that he had first spoken to the architect on the matter. He charged £14 6s. for removing it to another part of the grounds. The defendant alleged that the contract had been unsatisfactorily carried out, and that the £20 already paid would cover all extra expenses. Mr. F. Swinburne, the architect, denied responsibility for the cesspool being constructed under the bedroom window. Evidence was also brought forward as to the unsatisfactory manner in which the contract had been carried out, considering the big price paid. The judge said there was no necessity for an action if it had been stated that the architect was to be sole judge. He disallowed entirely the charge made for removing the cesspool, and strongly commented on the position which plaintiff originally chose for the construction of the cesspool without the authority of the architect. The plaintiff was awarded £7 15s. 6d. in addition to the sum already paid.

NOTES.

Miss Kathleen Beverly Robinson, teacher of modelling in the Toronto Technical School, has won the first prize of $50 in connection with the competition for designs for crest for the King Edward Hotel.

Mr. C. H. Blackhall recently delivered an address before the Detroit Architectural Club on "The Architect That Might Be." He emphasized the five essential qualities of the successful architect.—Artistic perception, the personality and character of an educated gentleman, common sense, the sense of construction and business ability.

" Perhaps one way to forget style " says Mr. J. J. Burnett, A.R.S.A., President of the Glasgow Institute of Architects, " is to sink ourselves in human needs, for that, after all is the basis of all architectural expression. Refinement of mind and thought are to be used quite unconsciously in the service of our fellowmen, and when that is so there is no room to think of style at all; the first duty would seem to be to make buildings meet the necessities."

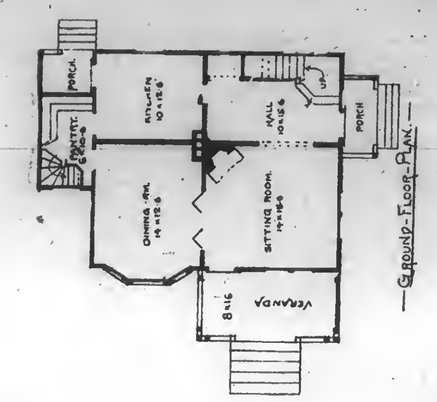
At the annual meeting of the Central Ontario School of Art and Design, held recently, the following gentlemen were elected as officers and directors for the ensuing year : President, Bernard McEvoy; vice-president and treasurer, W. Revell; secretary, George C. Downes; auditor, James Smith, R.C.A. ; directors, R. Y. Ellis, Robert McCausland, Eden Smith, Alderman S. G. Curry; J. D. Kelly, F. H. Brigden and George A. Howell.

By appointing Mr. Marshall, Director of Archæology in India, Lord Curzon has given the best practical expression of his wish and intention to do all in his power for the conservation of ancient monuments in India. The directions with which Mr. Marshall begins his work are very explicit, and it may be taken for granted that they will serve all purposes, including that referred to in the recent memorial from the British Indian Association, which is chiefly solicitous about the buildings appertaining to the Hindu religion in Bengal.

In reply to a correspondent the London Architectural Record gives the following as the requirements for successfully photographing architectural subjects:—We may briefly say, that the main requirements of an architectural photograph are that its vertical lines shall be vertical, its horizontal lines horizontal, its arches and windows shown complete and not cut in halves or quarters, its focus equal over the whole picture, its foreground, middle-distance and sky harmoniously arranged, and its composition truthfully rendered.

The management of the Louisiana Purchase Exhibition to be held in St. Louis, offer prizes of $2,500 for a design for a symbol or emblem to be used for the seal, stationery and advertising matter of every kind relating to the Exhibition. No rules are laid down as to lettering, sentiment, size or style of the design. The only stipulation is that it shall be symbolical of the great historical event which the Louisiana Purchase Exposition is to commemorate—the acquisition by the United States in 1803 for $15,000,000 from France, of 1,042,000 square miles of territory.

The horizontal mouldings serving as a sort of cap or cornice to the piers or arches, and on which the archivolts or curved mouldings and faciæ surrounding the arches themselves rest, are known as an impost. Like these latter, the impost is made plainer or richer, according to the order employed or to the general character of the design. And when the archivolts of the arches are omitted, either the impost is omitted likewise or a plain band substituted for it. This is generally done, says the Builders' Reporter, in basements beneath an order, they being usually rusticated, and the joints of the rustics sufficing for decoration and giving the requisite architectural expression. Imposts are contrary to the genius of the Pointed style, but, except in the case above alluded to, essential in Roman and Greco-Roman architecture. We have, however, a few instances in which imposts have been omitted, and the archivolt of the arch continued vertically down the edges of the piers. This was a favourite practice with Soane, both in his designs and many of his executed buildings, and it was also adopted by Burton in the arches of the Ionic screen and opposite gateway, Hyde Park Corner, Piccadilly ; but the effect is by no means happy, especially in external architecture, though it may be tolerated in buildings on a small scale, or which make no pretensions to correctness of style.



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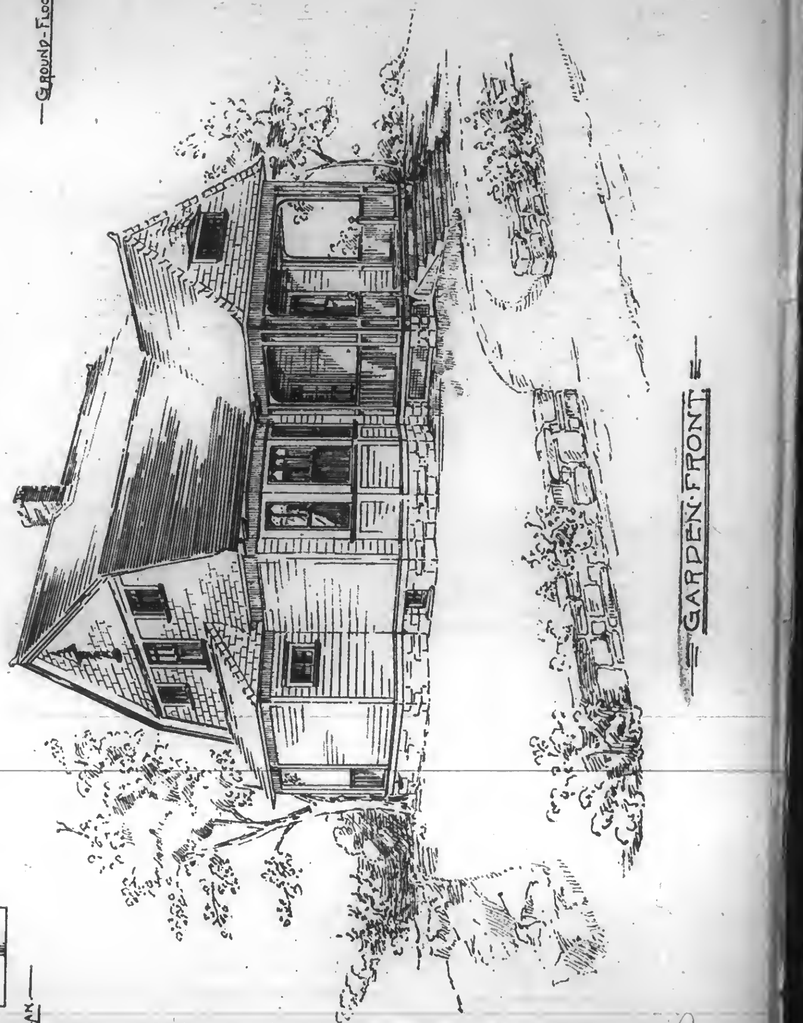

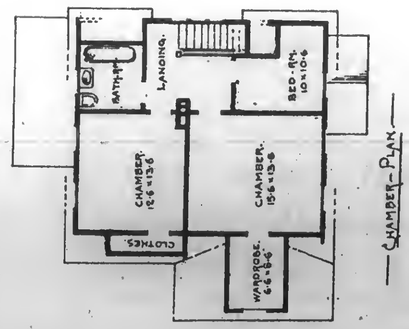

LOADS AND WORKING STRESSES FOR BUILDING WORK.

The committee appointed in 1899 by the Austrian Society of Engineers and Architects to report on "Specifications for the loading of structures, and the working stresses of materials of construction" has just (January, 1902) published the results of a two years labor. The following figures compiled from the report by Mr. F. C. Kunz, assistant to vice-president, Engineering Department, American Bridge Company, are of great interest for comparisons, says the Engineering Record, as they practically cover the same ground as our building laws. Items of local interest only, like data for special timber and for special stones, have been omitted. All figures are given in round numbers.

The figures have been carefully revised and such changes made as were necessry to adapt them to Canadian materials. The tables may be safely followed being based on 2200 lbs. to the ton. The table of working stresses is a little mixed, particularly that portion relating to timber, as the kinds of timber are not shown. However this matters but little as the calculations seem to have been made with some of the weaker woods.

Weight of Masonry.	Lbs. per cu. ft.
Common brick masonry, lime mortar	100-105
Common brick masonry, cement mortar	105-110
Hard brick masonry, Portland cement mortar	100-110
Best pressed brick masonry, Portland cement mortar	120-130
Hollow brick, lime mortar	80-90
Porous brick, lime mortar	70-80
Rubble masonry, light	140
Rubble masonry, medium	150
Rubble masonry, heavy	175
Ashlar masonry, sandstone	130-155
Ashlar masonry, limestone	125-160
Ashlar masonry, granite	200
Portland cement concrete, brick	110
Portland cement concrete, lime or sandstone	135
Portland cement concrete, granite	170

Weight of Building Material.	Lbs. per cu. ft.
Masonry debris	90
Sand	90
Slag	45
Coal ashes	45
Dry lime mortar	95
Dry cement mortar	105
Asphaltum	125-130
Gypsum	60-80
Cinder concrete	60-80
Glass	160
Dry earth	85
Wet earth	100
Gravel	125
Clay	95-110
Turf	10-25

Floor Live Loads.	Lbs. per sq. ft.
Mansard rooms	30
Residences	50
School rooms	60
Stairs, corridors, theatres, ballrooms, gymnasiums, armories, assembly rooms	80
Offices, light storage, above first floor	90
Offices, light storage, first floor	115
Ice storage (ice 3 ft. hight)	155

Wind and Snow. Loads.	Lbs. per sq. ft.
Hor. wind pressure on vert. plane	40
Snow pressure on horizontal plane	15

Only horizonal wind is to be assumed. If wind and snow loads are used combined, only two-thirds of the latter is to be considered.

Ultimate Bending Stress of Portland Cement Concrete Six Months Old.

Cement	Sand ; gravel.	Lbs. per sq. in.
1	3	600-710
1	3½	470-570
1	4	340-430

Permissable Working Stresses of Iron, Timber and Glass. In pounds per sq. in.

	Tension	Comp.	Bending	Shear.
Wrought iron and ingot iron	14,200	14,200	14,200	11,400
Cast iron	2,850	8,530	3,560	2,850
Glass cast	1,000		850	
Glass blown	1,000		650	

All rivet holes have to be drilled. Maximum pressure on bearing surface of rivets, 23,000 lbs. per sq. inch. For iron and wooden bridges special instructions exist.

The working stresses of timber.

Tension, from	1,140 to 1,420
Compression, from	850 to 1,000
Bending from	1,140 to 1,420
Shear, parallel to grain	140 to 210
Shear, perpendicular to grain	280 to 420

Buckling and eccentric loading have to be considered. (No formula given).

Permissable Working Stresses of Dimension Stones and Piers. In tons per sq. ft.

	I	IIa	IIb	IIc
Hard granite	100	60	50	25
Medium granite, hard limestone	70	40	30	..
Hard sandstone, medium limestone	50	30	25	..
Medium sandstone, soft limestone	35	20	15	..
Soft sandstone	15	10		

I refers to single dimension stones, with a factor of safety of about 15 ; IIa to piers whose height does not exceed 6 to 8 times their least dimension ; IIb to piers whose height does not exceed 8 to 12 times their least dimension ; and IIc to piers whose height does not exceed 12 times their least dimension. For all stones except granite, which are kept continually wet, these figures do not apply.

Permissable Working Stresses for Other Masonry. In tons per sq. ft.

	a	b	c
Common brick, lime mortar	5	7·5	10
Common brick, Roman cem. mortar	7·5	5	..
Common brick, Port. cem. mortar	10	7·5	5
Rubble, lime mortar	4	..	..
Rubble, Roman cem. mortar	5	..	..
Rubble, Port. cem. mortar	8	..	..
Coursed rubble, Port. cem. mortar	10	..	..
Hard brick, Port. cem. mortar	12	8	6
Best pressed brick, Port. cem. mortar	20	15	10
Concrete for foundations : Roman cement 1, sand and gravel 5	5	..	..
Concrete for walls : Portland cement 1, sand and gravel 3	18	..	..
" " 1, sand and gravel 5	12	..	..
" " 1, sand and gravel 8	8	..	..
" " 1, sand and gravel 10	6	..	..

In these groups a refers to walls not under 18 inches thick and piers whose height does not exceed 6 times their least dimension; b to walls under 18 inches thick and piers whose height does not exceed 6 to 8 times their least dimension ; and c to piers of at least 12 inches smallest dimension, whose height does not exceed 8 to 12 times their least dimension.

Permissable Working Stress in Masonry Arches up to 30-Foot Spans. In tons per sq. ft.

	Compr.	Tension
Common brick, lime mortar	6¾	0
Common brick, Roman cem. mortar	70	0
Common brick, Port. cem. mortar	10	1
Hard brick, Port. cem. mortar	12	1
Best pressed brick, Port. cem. mortar	20	0
Concrete, Port. cem. 1, sand and gravel 3	18	3
Concrete, Port. cem. 1, sand and gravel 5	12	2
Concrete with iron (Melan, Monier, etc., systems), Port. cem. 1, sand and gravel 3	21	8
Dimension stones, (exept soft sandstone) in Portland cement mortar	25	1

The figures are based on a mortar of 1:3.

Permissable working stress for stone stairs can be taken as one-fifth of the ultimate stress for bending.

Permissable Pressure on Foundations. In tons per sq. ft.

Soft clay and wet sand	1.0
Ordinary clay and dry sand mixed with clay	2.0
Loam, hard clay and sand without clay	4.0
Firm coarse sand and gravel	6.0

Piles in loose, wet soil should not be stressed more than 350 lbs. per sq. in. of their cross-section. They should be placed not more than 3 ft. apart.

Mr. W. E. Doran, architect, was recently appointed to the Montreal Board of Harbor Commissioners.

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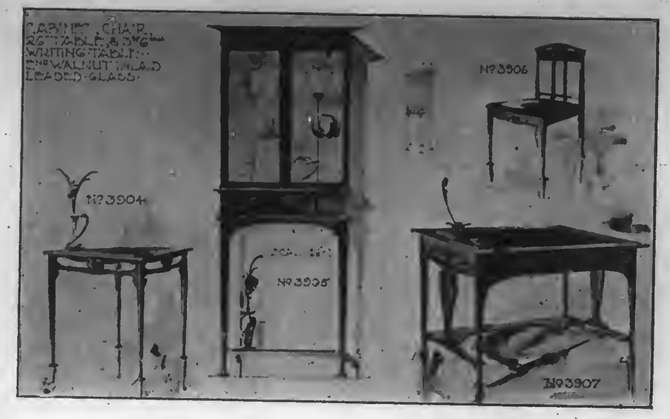

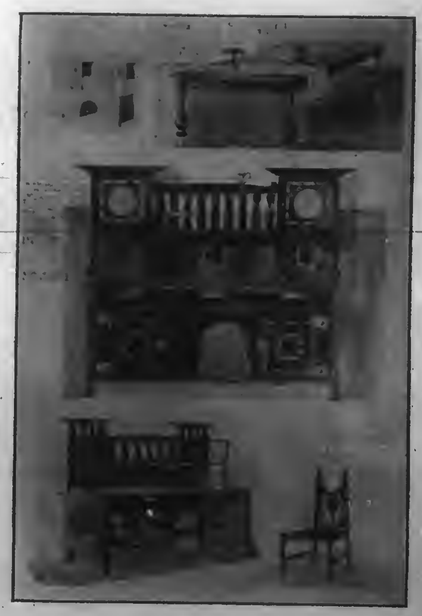

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n Scott & Co., architects.
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& Hastings, architects.

TEXT.
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CHITECTS' EDITION.
is, St. George Street, Toronto.—Messrs.

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Way 79
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TORS.
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S. H. TOWNSEND,
" FREDERICK G. TODD, Landscape Architect, Montreal.
" W. H. ELLIOTT, Toronto.
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Photographic Exhibition.

An exhibition of architectural photographs is a dull thing. The photograph is honourably matter of fact, no doubt, and tel's no deliberate falsehoods; but it cannot be said, in the fullest sense, to tell the truth. In the first place, of course, the very important element of colour is left out; not only in the building, but in the surroundings which do so much to set it off. In the second place the point of view is limited and the effect from an imperfect point of view is less satisfactory seen through a limited lense than through an adjustable and reasoning eye. The complaint of painters, that people see things not as they appear to the eye but as they know them to be, is not on the whole a bad thing. We may be unperceiving sometimes of the pictorial effects of nature; but for practical purposes when a man is finding his way across the country, for instance, it is of less importance that he should enjoy the effect of a purple patch of shadow in the middle distance than that he should know it means a bridge. In the same way the eye is able to translate perspective back to the facts it represents, and see in an extremely sloping line the effect of a level cornice. But more than this the eye has a way, if it is an intelligent eye, of selecting the most interesting points and ignoring those which are unimportant. A man of taste before a well composed building sees it as it was meant to be seen, with his attention fixed upon the essentials; and if he were to draw it would bring out these essentials. A photographic lense on the other hand is just as particular about the non-essentials; when confronted with a family group, as amateur photographers well know, it seems to devote its best efforts to the wall paper and picture wires. This cannot be called an artistic representation. For artistic representation we want a statement that is like a good story—the points all in, the twaddle all out; and the photograph is too much like an old woman's tale—laying equal emphasis on major and minor points—to satisfy this requirement. As a study in design, a drawing which brings out a little more favourably than can be done in nature the points of the design, is perhaps more profitable than a photograph which tends to overwhelm the points with minor details more than would be the case in nature. An exhibition of drawings is certainly more interesting.

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The Canadian Architect and Builder

VOL. XV.—NO. 174. JUNE, 1902.

ILLUSTRATIONS ON SHEETS.

Proposed "Carnegie" Public Library, Windsor, Ont.—John Scott & Co., architects.
Interior of St. Annes des Plaines church, Que.—J. Venne, architect.
Design for Lectern.—By G. S. Lemasnie.
House at Cold Springs Harbor, Long Island, N.S.—Carriere & Hastings, architects.

ILLUSTRATIONS IN TEXT.

Pair of Semi-Detached Houses on a Narrow Site, Toronto.—F. F. Saunders, Architect.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Two Photogravure Plates.—Residence of Mrs. T. M. Harris, St. George Street, Toronto.—Messrs. Burke & Horwood, Architects.

CONTENTS

Editorial 69-70
The Second Annual Exhibition of the Toronto Architectural Eighteen Club 71-72
The Architectural League of America . . . 73-74-75-76
Foundations on Quicksand 77-78
By the Way 79
Stone at the Royal Exchange, Colonial Exhibition . . xii.
Exhibition of Architectural Photographs . . . ix.

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they have the demerit of calling the course of reading a qualification, which it is not. They advertise in such a way that draughtsmen and builders' foremen think that this is the short road to become an architect. The result is an increase of the unskilled who do not know that they are unskilled, and a neglect of less attractive but more substantial means of training. Time will no doubt disprove the undue pretensions of these Schools, but at the cost of much loss and disappointment to students ; and if any professional body speaks in praise of the system there should at the same time be strict recognition of its limitations. There can of course be no question of a Correspondence School as a substitute for the Scientific Schools of McGill and Toronto University, but students should be warned against thinking it a sufficient substitute for the course of study and examinations of the Associations of Architects.

Building Permits.

Just how numerous and glaring are the defects of the so-called Toronto Building By-law, is known only to those who like architects and builders have intimate relations with the Building Department. Let us take as example the unnecessary and vexatious regulations governing the issue of a building permit. The Building Inspector's Department will refuse to grant an architect a permit until a receipt is produced from the waterworks department showing that payment has been made for the water which will be required by the contractor in erecting the building. This means that the architect must either take his plans to the water department and wait while the officials figure up from them the probable quantity of water required by the builder, or leave them behind and go or send for them the next day. There is no good reason why architects should be put to all this trouble and delay. If the plans when submitted by the architect are found to conform to the by-law as interpreted by the Building Inspector, the permit should issue forthwith. Arrangements for the supply of water should lie with the water department and the contractor. Advance payment for the water could easily be insured by the city refusing to turn on the water except on production by the contractor of a certificate of payment from the water department.

Architects and Landscape Architects.

Mr. Pentecost's paper, read before the Architectural League, points clearly to a conclusion, which he forbore to press, that, when the site of a building is sufficiently important to require the intervention of a landscape architect, he is the paramount designer. Repton, as quoted in the paper, is less modest. "Repton's position," Mr. Pentecost says "is, that while the landscape architect should have no official voice in the actual designing of the house, the style and general arrangement, location and disposition of the house and grounds should be officially determined by the necessities of the landscape architect's general plan ; for, as Repton says further, 'to my profession belongs chiefly the external part of architecture, or a knowledge of the effect of buildings on the surrounding landscape.'" All this is quite true. The site prescribes the character of the building ; the building aims to be as it were a part of the site ; and if the architect is obliged to call in a landscape architect to enable him to understand the possibilities of the site, it goes without saying that he must base his design upon the understanding thus received. This is all Mr. Pentecost spoke for—co-operation. But there is a dark hint lying in his statement that "the true solution of the problem rests with the progress and recognition of landscape architecture as a profession." He goes on to show that there has been hindrances to the development of of this profession—to its development that is to say, from landscape gardening, as it used to be called, to landscape architecture. When fully developed and recognized are we to expect that the landscape architect will rise from being employed by the architect to employing the architect? Will the co-operation, that Mr. Pentecost rests upon, change from an architect inviting the co-operation of a landscape gardener to the landscape architect inviting the co-operation of a house planner? It is the logical sequence. The major quantity fixes the condition for the minor. As the house (that is the architect) fixes the conditions for the supplementary arts of painting and sculpture, so the site (that is the landscape architect) should fix the conditions for the house. But logical consistency is an imperfect guide to life. The house is after all the principal thing. It is more impossible for the landscape architect to grasp the requirements of that problem than it is for the architect to seize upon the points of a site—and take advice from a landscape specialist.

The Education of Architects.

THERE is something most praiseworthy in the continual discussion by architects of means for the better education of students, but there is surely something that can be done by architects to educate themselves and each other. The absence of this element from the discussions of architects gives a strange air of unreality to their talk about education. It is of course useless to the cobwebs, and a surprising amount of good feeling talk of set studies, or problems, or prizes for busy architects, but Mr. Bispham Page spoke a bottom truth when he pointed out that an architect learns the best things he knows after he has begun practising ; and the question is whether architects would not materially hasten each others' development by a systematic exchange of ideas. Meeting to study problems in the abstract is too laborious and it is school boy work any way ; but the study of current problems, which constitutes this post graduate course, which Mr. Page speaks of, which architects are taking all their lives, could be made more profitable and much quicker in operation by meeting other architects systematically for mutual criticism and discussion. The old fashioned jealousy of architects for one another has almost disappeared, under the influence of greater culture ; it indeed, in the matter of design, it has not altogether disappeared. There is no reason why it should exist. There is so much individuality in art that however much a man may give of his ideas he will never find that they are taken up by others in the same way he has taken them up. If every one pours freely into the the fund of common experience there will be a gain all round, without increase of conflict, for, though every man takes from it the same material, it will be found worked up into different products. He who contributes most to discussions of this kind will gain the most; for, by the effort of explaining his ideas, he will clear them up as they never were before. Clear thinking is the fruit of expression, and one reason why it is so difficult to get contributors to professional paper reading and discussion is, that there is so little clear thinking and so much disinclination to the effort of thinking clearly. There ought therefore all the more be a prosperous career for a series of meetings to which members could bring, not their discoveries, but their doubts and difficulties. It is twice as easy to solve a problem in conversation as alone ; and if there is no solution, if the designer is up a blind alley, as so often happens in design, a light from outside is the quickest way to show him where he is. Architects could improve one another incalculably by regular meetings for mutual criticism.

The Durability of the Steel Frame.

THE rumour that the pulling down of a twelve year old steel frame building in Chicago has shown its lower columns to be half eaten through with rust contradicts the evidence of the gridiron foundations of the old post office which after a longer term of years, if we recollect rightly, were found to be in good order inside their cement casing. But if this rumour is true, (and doubt is cast upon the preservation of iron in cement), it will be a serious addition to the uncertainty which is felt as to the life of a steel frame building. This discussion has been revived in the American papers and reports of experts are so contradictory that the question may be said to rest in doubt. In the meantime steel frame buildings are being rushed up more than ever and we may be sure that carefulness does not increase with familiarity. Representations have been made of the danger of efflorescent brickwork in contact with the steel frame. If the corrosive salt is as freely efflorescent on the inside as it is on the outside, the wall can hardly be called a protective casing. Is any brickwork in fact sufficient protection to a metal which must be kept from exposure, not to the weather merely, but to the carbonic acid convyeed in ordinary air. It is possible to blow a candle out through a brick wall, by placing the candle at the small end of a funnel held tightly against one side of a brick wall, while the mouth is applied to the small end of a funnel held tightly against the other side exactly opposite. There must therefore be a continual change of air between the inside and the outside of an ordinary brick wall. How much carbonic acid accompanies the change depends upon the amount detained by the mortar. The affinity of lime and cement for carbonic acid must be taxed by sudden changes of temperature or in a high wind when the change of air in the walls is rapid, and there must come a time of satiation when the mortar can no longer be relied upon to stop the passage of the gas. Brick and terra cotta surrounding a steel frame is supposed to be grouted so as to be impervious to air, but it is doubtful if it can be made so at the best, if we may trust the evidence of tests for the permeability of walls, and there is sure to be much laxity in practice.

On the whole there is not enough certainty about the protection of the steel frame buildings ; but they are being built in greater and greater numbers. It is said that twenty-four millions worth of office buildings have been begun in New York this season and steel frame construction is in progress for uptown buildings also. The centre of commerce has moved up a good deal ; and above that apartment houses grow taller and taller, in the effort to accomplish the end of making the same limited area hold an increasing population. About the time New York is solid with steel frame buildings the catastrophe to the earlier buildings of the kind—if there is going to be a catastrophe—will be due. In view of this state of affairs insurance companies are interested and the question of durability is going to be thoroughly tested by an Experiment Station, established by the efforts of Mr. Edward Atkinson, under the direction of a member of the staff of the Massachusetts Institute of Technology.

THE SECOND ANNUAL EXHIBITION OF THE TORONTO ARCHITECTURAL EIGHTEEN CLUB.

The Toronto Architectural Eighteen Club is to be heartily congratulated on the very successful nature of its Second Annual Exhibition which was held during the last week of May in the Galleries of the Ontario Society of Artists.

The exhibits consisted mainly of photographs, a few pen and ink drawings and some pastels and water colors. The subjects were of remarkable range and variety, for the Architectural League of America was well represented and some fine European photographs were loaned ; Montreal, Quebec and Vancouver all assisted to lend increased interest to the collection.

Some of the photos were chiefly remarkable as photographs, the subjects being scarcely entitled to such excellent reproduction; on the other hand, photography with its inherent defects of perspective, failed to do justice to many of the subjects.

As the exhibition was by no means confined to members of the Eighteen Club, it is to be regretted that so many of Toronto's architects were not represented. Such exhibitions can have none but a beneficial effect, by bringing architects together, brushing away and good fellowship is generated ; it it is good for one to mix with one's fellow men surely it must be still better to associate with fellow workers, to exchange ideas and broaden our views. Every architect to whom the advancement of art is more than a mere phrase should endeavor to be represented at this exhibition in the future.

The real live interest shown by our United States friends in this and similar exhibitions is instructive ; they send hundreds of beautifully framed and mounted photographs from many different points widely scattered over a continent to help out a numerically small Architectural Club in Canada ; their genuine interest in the welfare of architecture and their belief in the good derivable from such hearty co-operation is quite clearly demonstrated, and it is to be hoped that every Architectural Society in the Dominion will emulate this friendly example.

If I may venture to offer a suggestion, I think the interest in the exhibition could be greatly enhanced if small scale sketch plans more frequently accompanied the photos, more particularly of interiors. The soul of a design lies in the plan and if the true value of the design is to be appreciated its plan must be shown or at least indicated.

I cannot make mention of every interesting work as the catalogue, which by the by was rather late in making its bow, contained so much that was admirable. I can only make reference to some of those numbers which appealed most strongly to me: Messrs. Bailey & Truscott, Philadelphia, sent a fine collection of photos of executed work, a quaint "Colonial" Exterior, No 11, and a quiet gabled house with half timbered upper stories, No. 22, being particularly attractive.

It is difficult to judge sculpture from rather small photographs in which both scale and technique are almost lost, but the "Stitch" (in clay ?) of Commodore Bainbridge & Stewart, No. 124, seemed to give promise of much greater interest than the other work shown by H. K. Bush Brown (Newburg, N. Y.), though the group, "Indian Buffalo Hunt," No. 122, shows life and spirit.

Messrs. Cope & Stewartson, Philadelphia, contributed a round dozen of fine photos, every one representing work worthy of their reputation: No. 155, "Entrance to House at Edgehill," is simply exquisite, and No. 157, "Dormitories, University of Pennsylvania, from the Terrace," is a fine piece of transplanted English collegiate building.

Of Nicola D'Asanzo's decorative designs, No. 171, "Ball Room Decoration for W. W. Gibbs, Esq.," is a singularly fine composition. The remainder probably depend largely upon the scheme of co'or, which is of course lost in the photos. "Egypt Awakening," No. 190, F.F. Elwell, is in my opinion far ahead of all the other exhibits of sculpture.

No. 212, "Dining Room, Codmore, Hyland," (H. G. M. Gordon) and Nos. 55 and 56, "Dining Room" by A. H. Brokie, Philadelphia, are specially quiet and reserved.

Nos. 236 to 242 is a series of enlargements admirable in light and shade and peculiarly interesting as illustrative of the American Garden.

"Pantry Fittings," by Messrs. Kennedy & Kelsey, of Philadelphia, is a wonderful little bit of skillful contrivance, and the photo of a Mantel, probably in the same house as the Crystal Palace of a Pantry, is as refined as it is effective.

A good collection of photos of Port Sunlight, lent by Sproatt & Rolph, Toronto, indicate the happy result of several architects all working on similar lines and in sympathetic accord.

No. 295, "Bachelor Apartments," F.M.Mann, with an oak hall, kindly rendered by both architect and photographer.

Nos. 298 to 299, Mewman, Westman & Harris, Philadelphia, seemed to me to be the softest and most beautiful photos in the collection, the play of light and shade about the picturesque half timbered house in the trees being quite charming. For the furniture I can find little good to say. Nos. 317 to 320, C. Rholfs, Buffalo, appears to me to confound subtle simplicity and direct carpentry with sheer affectation and then smothers the unfortunate result with surface ornament, which is not bad in itself but so shockingly ill applied. Some designs of furniture seem to abhor a plain surface even of very beautiful material.

H. W. Weller, Montreal, sends Nos. 405 and 406, "Some Typical English Beauty Spots."

Judging from the bronze work, Nos. 411 to 417, by John Williams, New York, it would seem that funds are not doled out to the architect in the United States in the 10 cents at a time measure that is too commonly the case in Canada; but it is this very point which emphasizes the great difference between United States and Canadian Architecture. The Toronto architect has to exercise a degree of self restraint that his confrere across the border seems to wot not of. Rarely indeed can the Canadian architect let himself go because he has so commonly to solve problems involving the greatest possible return for the minimum outlay, and in Toronto the result is for the most part extremely gratifying, as may be seen by referring to the numerous exhibits of work by the President, which illustrates most aptly how a simple and dignified effect may be gained entirely by means of good lines, careful grouping and clever fenestration; all the detail being thought out and applied with a sparing and subtle hand.

This self command is evident in much of the work of other exhibitors, and the English influence is also very marked in Messrs. Burke & Horwood's lovely little Bible Training School. And the garden front to "Castle Frank" and the Stables by the same gentlemen are delightful.

No. 368 to 376, "House in Queen's Park," by Messrs. Sproatt & Rolph, further illustrates the growing grip that the English influence is taking on Toronto; Messrs. Lever Bros. premises by the same authors emphasizes this fact very successfully.

Nos. 378 to 381 are exceptionally good pen and ink perspectives of Symons & Rae's new University Buildings at Kingston,.

No. 144 is perhaps the most pleasing example given of Chadwick & Beckett's work: E. J. Lennox is represented by some very fine enlargements of photos of his well-known work in the city.

No. 444, "An Artist's House," H. Payette, Montreal, is a pretty French villa such as one sees at Strasburg, for instance.

The impression received from this exhibition is that the influence of the French school is but little felt in Toronto, and that the so-called "Colonial" of the United States which has been so absolutely boiled to rags by ardent caricaturists in Canada as well as in the United States, has little hold upon Toronto. The influence of the modern English school on the other hand has rooted deeply in a congenial soil, and in so many able hands will doubtless greatly thrive in the near future. Toronto has a great architectural future and if the members of the profession will but work together the Queen City will probably give the note to the character of Canadian Architecture.

ROBERT M. FRIPP.

The modelling and carving of an immense frieze on the Stanford University memorial arch, in California, marks the completion of a colossal undertaking in sculpture. The arch is over 100 ft. high and is built of Sau Jose limestone; running around it at a height of 80 ft. is the frieze, illustrating American civilization. The total length of the frieze on the four sides of the structure is 232 ft.; its height is 12 ft. It contains 150 heroic figures in high relief.

THE ARCHITECTURAL LEAGUE OF AMERICA.

For the first time the Architectural League of America met in annual convention on Canadian soil. The fourth convention opened in the Gallery of the Ontario Society of Artists, King St. West, Toronto, at 2 p. m. on May 29th., Mr. J. C. Llewellyn, the President, presiding. Among those in attendance were the following: J. C. Lewellyn, Chicago Architectural Club; E. J. Russell, St. Louis Architectural Club; Charles Pfeil, St. Louis Architectural Club; A. C. Barrett, Eden Smith, William Rae, Charles E. Langley, J. C. B. Horwood, C. H. Acton Bond, Henry Sproatt, J. Francis Brown, A. C. Barrett, J. P. Hynes, Toronto; Dwight Herald Perkins, Robert Craik McLean, (editor Inland Architect), Chicago; Newton A. Wells, Champaign, Ill.; Francis S. Swales, Detroit Architectural Club; Cheri A. Mandelbaun, Detroit; Frederick G. Todd, Montreal; Frederick William Strabenger, Ira O. Hoffman, Albert E. Skeel, Cleveland, Ohio; Herman Krégelius, Cleveland Architectural Club; William Laurie Harris, Frederick S. Lamb, John Harder, Geo. Pentecost, Jr., H. K. Bush Brown, New York; Emil Lorch, Chicago Architectaral Club, Cambridge, Mass.; A.C. Williams, Chicago Architectural Club; Henry D. Bates, Architectural Review, Arthur D. Rogers, Boston.

MR. ALBERT KELSEY, Past President, Philadelphia.

MR. EMIL LORCH, Corresponding Secretary, Chicago.

The delegates from the United States were welcomed to Toronto by the President of the Toronto Architectural Eighteen Club, Mr. Eden Smith. The President in his reply referred to the small attendance as due to the Convention being held at a time of the year when architects were unusually busy.

Mr. E. J. Russell, of the St. Louis Architectural Club, was elected speaker of the Convention, Mr. Albert E. Skeele, of Cleveland, Ohio, Secretary, Mr. Julius F. Harder, New York and Mr. C. A. Mandelbaum, of Chicago, auditors.

The report of the Executive Board presented by Mr. Llewellyn stated that the past year had been an uneventful one, the work of the League having been largely carried forward by the Committees. The board recommended that adequate provision be made for the publication of the proceedings. Several applications to aid in securing legislation of interest to architects had been referred back to the Clubs for individual action. The report of the Committee on Circuit Exhibitions showed that difficulties had been encountered in carrying on these exhibitions according to schedule, and that some new arrangement would probably have to be made. The report of the Committee on Current Club Work stated that there had been an increase in membership in nearly all the Clubs during the year, and that much attention had been given to the subject of municipal improvement, many of the Clubs working in harmony with the municipal authorities. This was particularly the case in Cleveland and St. Louis. The Cincinnati Club had set a good example to the other Clubs by making a collection of photographs and drawings of interesting old buildings. Reports were read showing in detail the work on which the various local Clubs have been engaged during the year. These reports showed that the expense of the exhibitions held under the auspices of the Clubs forming the League, had ranged from $1,300 to $8,000, and that the interest manifested by the public had been very disappointing. On this point, Mr. Pfeil, of St. Louis, stated that the Club which he represented were finding it more difficult every year to raise the money for their exhibition. The admission fees received amounted to only $30 or $40, the balance of $2,000 having to be raised by advertising. It was found that by joining the Artists' Guild a larger attendance and greater interest was secured.

MR. HERBERT B. BRIGGS, Cleveland.

For the Architectural Eighteen Club of Toronto, Mr. J. P. Hynes, the Secretary, reported as follows:

"We are not able to report any increase in our membership, but I think we have a reason that makes that excusable. We have had in Toronto for fourteen years an Association of Architects, but its aims and purposes are quite different from ours. So we have kept the membership of our Club small, thinking that in that way we could best do our work. We have carried out two exhibitions, both of which have proved to be financially successful. One direction in which the Club has worked has been in the matter of education. The building in which this Convention is meeting is really an Art School. Night classes were going on here without any architectural class, but architectural classes are now included and the members of the Toronto Architectural Eighteen Club give the instruction. There were eighteen students registered last year. Mr. Bond is chairman of the committee in charge of that work, and some of the problems worked by the students appear in drawings on these walls.

In the matter of municipal improvement we have not done much in Toronto so far but talk. We have had communications with the Ontario Government in regard to the faulty location of a large building now in course of construction for the School of Practical Science. We have also had communication with the municipal authorities in regard to having a proper plan for the Exhibition Park, but have been unsuccessful. Following that we joined with the Guild of Civic Art to protest against granting to a Baseball Club a piece of property which we thought would be detrimental to the city to grant for such a purpose. We had a conference with the Manufacturers' Association which has shown some interest in artistic improvement, and which on the occasion of the Duke of York's visit to Toronto erected an arch at their own expense. We have also had several conferences with the city authorities with the view of having a plan adopted for municipal development, and hope yet to succeed. Our principal work this year has been the making of plans for this Convention. We have held our present Exhibition in the effort to make your visit interesting. It is a very modest one, being composed chiefly of photographs, but we hope you will appreciate our efforts in the matter."

Professor Newton A. Wells in reporting for the Toledo Club protested against the admission to the Circuit Exhibition of work which was below the proper standard. Mr. Bush-Brown intimated that undesirable exhibits could be weeded out by the individual Clubs. Mr. Llewelyn suggested that it might be a good thing to make the Circuit Exhibition of photographs only, leaving the local Club to supplement these with drawings. Mr. Swales, of Detroit, thought if the object of the exhibitions was to educate the public to appreciate better design, photographs or water color would be found to be better than line drawings. The following resolution wss passed on motion by Mr. Harder: "That proper photographs of architectural, decorative painting, and sculpturesqe subjects should not be generally excluded from exhibitions, but should be admitted and such photographic reproductions should in future form the nucleus of the Circuit Exhibition".

Mr. Frederick S. Lambe, of New York, urged that an effort be made to bring into the League allied organizations, having an interest in promoting the objects that the League has in view. Professor Wells moved that a committee be appointed to bring in a recommendation on the subject, and the following were appointed a committee for that purpose: Messrs Harris, Llewelyn and Bush-Brown.

GROUP PHOTO OF PERSONS IN ATTENDANCE AT THE CONVENTOIN IN TORONTO OF THE ARCHITECTURAL LEAGUE OF AMERICA.

At the evening session Mr. Bush-Brown presented the report of the committee on Municipal Improvement. This Committee reported in favor of the recommendation that had been made to broaden the scope of the League by endeavoring to secure the alliance and co-operation of other societies.

The report was adopted.

Mr. Llewelyn introduced a resolution that Mr. Bush-Brown be requested to write a lecture, illustrated by lantern slides, to be used as part of the Circuit Exhibition, and that accompanying this lecture should be a travelling library of civic improvement literature. The resolution was seconded by Mr. Lambe and carried.

Mr. Geo. F. Pentecost, Jr., of New York, presented an interesting paper on "Landscape Architecture," referring particularly to the relations between the architect and the landscape architect. On motion by Mr. Hynes, a vote of thanks was tendered to Mr. Pentecost. This was followed by a paper by Mr. Charles Mulford Robinson, of Rochester, N.Y., read by Mr. W.L. Harris, of New York, on "Civic Art as Evolution, Not Revolution", for which a vote of thanks was tendered to the author. Mr. Julius F. Harder moved an amendment to the Constitution changing the date of holding the Annual Convention from Thursday to Monday. Mr. Hynes moved that section 25 of article 8 of the Constitution be amended to read: "The Annual Convention shall be held at 10 o'clock a.m. at such place and on such date as shall be designated by the previous Convention, and that paragraph "n" of section 28 be amended to read " Designation of time and place of next Annual Convention". The motion carried. After adjournment for luncheon, a group photograph of the gentlemen attending the Convention was taken by request of the publishers of the CANADIAN ARCHITECT AND BUILDER. The afternoon was spent on the lake and concluded with a dinner at the Royal Canadian Yacht Club.

At the morning session on the 30th the Committee re Exhibit of Model City at St. Louis Exposition submitted the following resolution:

"Whereas the improvement of towns and cities is a subject of widely recognized importance to the people of the United States, and whereas civic improvements of a permanent character must soon transform any community, "reflecting man in his full twentieth century developments," exhibiting not alone his material but his social advancement in a most conspicuous manner, and whereas science and art in modern city building have formed a subject of department exhibits at three international exhibitions abroad, therefore be it resolved that the Architectural League of America in Annual Convention assembled petition the commissioners of the Louisiana Purchase Exposition to make provision for an exhibit which shall have these characteristics.". The resolution was adopted and a copy ordered to be sent to the commissioners. A number of short papers on various phases of the educational question were presented from Louis H. Sullivan, Chicago, William L. Harris, New York, Herbert H. Briggs, Cleveland, Percy Ash, Washington, Professor Newton A. Wells, of the University of Illinois, John W. Case, of Detroit. These papers all had a bearing on the subject of education in schools and universities and were supplemented by letters from gentlemen connected with various universities. The reading of the papers and letters was followed by a lengthy discussion of the following points:

(1) Is a National American Art University a desirable or necessary Institution?

2. Should the National Government have connection with or jurisdiction over a National Art University, or should the organization and control be similar to that existing in American Universities?

The preponderance of opinion expressed was in favor of a National Art University founded on broad lines and subsidized by the Government. Professor Wells was of opinion that such a University should include the workshop. He did not belleve it possible to teach the theoretical side of art or to make a designer without requiring the student to work in the material.

At the morning session on the 31st a paper was presented from Geo. D. Page, of Philadelphia, on "Club and Inter-club Self Education". Mr. Llewelyn in discussing this paper expressed the opinion that the old method of educating the draughtsman by starting him in an architect's office has gone by. The new men coming into the offices are all products of the scientific schools, hence the necessity of the League placing itself in as close touch as possible with these schools. The Club should be made as attractive as possible and an effort put forth to get the graduates of the scientific schools as members. A paper on the same subject was read by Mr. Emil Lorch, of Cambridge, Mass. In the discussion following, several of the speakers gave testimony in favor of the value of the work done in behalf of architectural students by the Correspondence Schools. Mr. Dwight L. Perkins, of Chicago, read a paper on "Architecture and Citizenship".

Some further discussion took place with regard to the Circuit Exhibitions, Mr. Pfeil making the suggestion that a prize be offered for the best example of architecture exhibited in the photographs comprising the Exhibition. The various suggestions made on this subject were refered to the Committee on the Exhibition Circuit.

At the afternoon session the following Committee were appointed: "Publicity and Promotion"—Frederick S. Lambe, New York, Chairman, James P. Llewelyn, Chicago, and the new President. "Auxiliary Committee on Publication and Promotion"—D.C. Boyd, Philadelphia, Chairman, Mr. Blackhall, Boston, Mr. Perkins, Chicago, Mr. Hewett, Brooklyn, Mr. Skeel, Cleveland. " Code of Ethics ahd Competition "—Julius F. Harder, New York, Chairman, Messrs. Striebenger, Cleveland, Shean, New York. "Current Club Work"—E. J. Russell, St. Louis, Chairman, Messrs. Hayes, Philadelphia, Hynes, Toronto. " Education" Emil Lorch, Cambridge, Mass., Chairman, Messrs. Ash, Washington, Case, Detroit. "Publicity and Records", Emil Lorch, Cambridge Mass., Chairman, Messrs. Skeel and Kregelins.

On motion by Mr. Hynes, those scholars who win the travelling scholarships of the Clubs which send scholars to Europe were appointed a Committee on foreign exhibit of the League. This Committee will consist of Mr. J. H. Phillips, of the Chicago Club, and Mr. Morris Leisenring, of the Philadelphia Club.

The Convention next proceeded to the election of officers. Messrs Frederick S. Lambe, of New York, and Ernest J. Russell, of St. Louis, were nominated for the office of President. Mr. Russell withdrew in favor of Mr. Lambe, who was unanimously elected. It was decided to hold the next Convention at St. Louis on Monday and Tuesday, the 12th and 13th of October, 1902. The following gentleman were appointed as a Committee on Exhibition Circuits: Mr. Harris, New York, Chairman, Mr. Kleinpell, Chicago—the third member to be appointed by the President.

Votes of thanks were tendered to Mr. Skeel, the Secretary of the Convention, and to the Toronto Architectural Eighteen Club. Afterwards the Convention adjourned.

THE BANQUET.

Following the conclusion of the business sessions a banquet was tendered the visitors by the Toronto Architectural Eighteen Club at McConkey's Restaurant.

Responding to the toast, "Our Guests," Professor Wells said: When I started from home to come over here, I will tell you what I thought, and I know the rest thought the same; "we are going over

to that Eighteen Club ; that is a small Club composed of energetic, good-hearted fellows, and we are going over here to give them a lift, and to pat them on the back." But, confound it, when we got over here it was just the other way—we are the little end of the horn. I have not been at any convention where we have been more handsomely treated or more profoundly impressed with the energy and seriousness of the work we have seen. We had prided ourselves on being Yankees, possessing the energy of the world; but we are going back home with the intention of trying to keep up to the band-waggon. (Applause).

On behalf of the Ontario Association of Architects, Mr. Edmund Burke responded in humorous vein as follows :

Mr. President, I did not expect to be called upon to say anything here this evening—I regret that the President of the Ontario Association is out of town, and neither our Vice-President nor our Second Vice-President are here.

I think the discussions of last night, particularly, must have affected me.

I did not remain as long at the closing ceremonies as Professor Wells. I understand I missed a good deal—I had but a cracker, some cheese and a glass of ginger ale, and left at a respectable hour. If I had remained later I might have had a more lurid experience, but even as it was, I had, that night, or rather in the early morning hours a curious dream—I do not know if it was caused by "The Information of Knowledge" (see programme of convention) or the cheese or the ginger ale, but it was somewhat like this, (and I do not know but that a Joseph or a Daniel will be needed for the interpretation thereof). A building took shape; it was orthodox in design—column, entablature, and cornice of correct proportions. On one side was an archway. The handsome wrot. iron gates swung suddenly open, and out dashed a well equipped hook and ladder waggon; the buckets dangling beneath were labelled O.A.A. and the crew had helmets with the same initials. But the curious part of the outfit of the crew was their coats. They were made of Whatman's double elephant paper with plans and elevations neatly drawn and titled. In place of buttons they were secured with thumb tacks which occasionally became unfastened. The nearest fireman to the man whose coat became unfastened would drive the pin into its place by a whack from a pike pole, causing a momentary wince on the part of the party of the first part, indicating that the pin had penetrated more than sufficient distance.

Another building took shape. It had a dado chin-high; upon this were set columns in groups; they were four diameters high, they each had fourteen flutes and a plain space which I found, on spacing off with a divider left room for four more. The volutes of the wide spreading caps were turned upside down; the frieze was six feet high and the cornice six inches with a projection of five feet, and half of the six inches was occupied by dentils, each six inches wide, at one quarter inch spaces. This building had, likewise, an archway, with real bronze gates. Instead of bars or panels each leaf was composed of the Roman numerals XVIII with horizontal top and bottom bars held together with a vertical rod thus ⊞.

In some positions, like the signs you sometimes see, you could scarcely make out the XVIII, but, open, shut or half shut the bars remained visible. Out of this archway dashed a little spick-and-span chemical engine with a thirteen inch gong on the dashboard. The buckets were labelled XVIII, and the helmets of the crew likewise. They were also dressed curiously. Their coats were black prints on a white ground, and colored with aniline ink. The coats did not come unbuttoned—they had no buttons—they were made out of whole cloth, and fitted without a wrinkle.

I forgot to mention that the hook and ladder wagon was drawn by horses. The chemical engine was a gasoline locomobile, and one could not help knowing when it was around—within a block or two.

Well, just as the hook and ladder wagon was turning a corner the off horse slipped and fell bringing the wagon to a sudden halt. The chemical was close behind and before one could say "Jack Robinson", had dashed into the wagon. The chemical tank exploded with a loud report, and the fumes smothered both crews.

At this point my front gate clicked and I heard the milk-man clattering up with his bottles to the side door.

While I mused on the interpretation of this dream I dozed off again, and had another:

I saw in my vision a magnificent dog-cart. The wheels were about seven feet in diameter, and I counted thirteen spokes in each. The high seat was about twenty-four inches higher than the low seat—(remember this was a real dream). It was drawn by a tandem team of fourteen horses—hackneys I think, and the little shaft horse was a most restive colt—always nipping the haunches of the nag in front of him, in order to make him move ahead a little faster. I observed that there were four spare sets of harness stowed away under the seat—I presume for that many additional horses by and by.

The cart had red and white stripes painted around the box—thirteen, I think I counted, and one oblong panel had a lot of stars in it.

The driver was a fine young fellow, I should say about 6.333 ft. tall, and he looked well on the high seat. He remarked to me that he had a fine team—most of them thirty six hands high. I said he was talking nonsense. He said he had measured them and showed me the scale. I called his attention to the fact that he had used the ⅙ inch instead of the ¼. He then said they were eighteen hands high, and proceeded to demonstrate the fact. I then showed him that he had included the dead ends of the scale and that they were just fourteen hands high, fair measurement. He then remarked that they were "goers, anyhow".

On the lower seat I noticed a smallish man, with sandy whiskers of Lord Dundreary type. He wore a stove-pipe hat about nine inches high, innocent of curve or entasis, and with a flat rim. Its color was faded and ancient—about the shade of the India ink seen on the drawings of the students in the exhibition. It was a pretty old hat, though still useful.

The old gentleman wore a fob, and a large seal graven with the letters O. A. A.

The young chap had a large white tag pinned to his coat, on which was printed A. L. A.

The old gentleman smilingly listened to my conversation with the young man, occasionally nodding his head, whether in approval of what I said or what the other chap said I could not discover.

The A. L. A. chap then tickled the shaft horse with his whip. The shaft horse thereupon nipped the rear elevation of his neighbor, and as they were vanishing in the distance the old gentleman shouted, "we are going to drive through the suburb of Hamilton, then on to Suspension Bridge and then on to the Great American Art University at Buffalo". I though he emphasized the word "Suspension"—possible it had no connection with the University.

Just then my front gate clicked again, and the iceman tumbled a cake of ice on the side steps. I slept no more after that.

Gentlemen it has been an inspiration to me, and I feel sure to the other members of our Association who have heard the discussions at your Convention on art matters. I regret that we as an Association have not been able to show you much attention, but you have been so well entertained and your time has been so fully occupied that there has been no opportunity. We hope, some day, to meet you again and to have this opportunity.

FOUNDATIONS ON QUICKSAND.*

Meriden lies in a valley between high hills. In the valley, which is claimed by some to be the original bed of the Connecticut River, is a soil which consists of sandy loam, a little gravel and plenty of quicksand. Most of the buildings in this valley rest on the skin which is found at various depths below the surface, and here the Meriden Gas Light Company bought a 300 by 500-feet meadow lot adjoining its works on which to erect a new holder. Careful borings were made over a section 120 ft. wide by 250 ft. long to determine the thickness of the gravel, if any, and its distance below the surface. To the west of this section, and 25 feet distant, runs a shallow brook, 20 to 30 feet wide—shallow except in freshet time. About seventy-five tests were taken, and the result laid out and plotted into curves, so that the most desirable place for the site might be located. The top material was a sandy loam, evidently a silt deposited from the overflow of the brook when in past years it was not so confined ; the next a good gravel, but very thin ; below that a quicksand of unknown depth. At a few points the gravel was found as near as 2 feet from the surface and 2 feet thick, while at the others it was 8.5 deep and only 0.4 thick, shading off to nothing. The average depth, however, taken from the boring stations, was 5.5 ft. deep and 1.2 ft. thick. A boring of 50 feet taken in the centre of the site showed 42 feet of quicksand and still more below.

On such materials it was decided to construct the foundation and erect a steel tank-holder, to be 115 feet in diameter and 103 feet high; holding 700,000 feet of gas in three lifts. The weight of the ho'der to be 475 tons and the weight of the water to be 8,625 tons or a total of 9,100 tons.

As the work of excavating progressed and the gravel was exposed, there was found a clearly defined depression diagonally across the pit, as if at some time the brook had flowed that way; for logs and trunks of trees were found together with a quantity of brush. Through this depressiou the gravel was very thin, and in three places the quicksand was entirely exposed—the first, a space 10 by 15 feet; the second, a space 4 by 12 feet; the third, a space 3 by 15 feet.

Hardly had the whole of the loam been removed when a rain came, followed by a heavy freshet, overflowing the meadow and deluging the pit. When the water had subsided it was pumped out in 8 hours with a 4-inch centrifugal pump and a 7½ horse-power motor, though the water was ten feet deep in some places. The freshet convinced the company more than ever that in erecting a holder it would be advisable to make the top of the foundation above high-water mark, which in this case would mean a fill in some spots of 12 feet, with an average of 8 feet, and the steel tank would be 2.5 feet above the level of the meadow.

At this point a difficult problem was confronted. Meriden topographically is on high hills and in a sandy valley; good gravel is a very scarce article. Four miles away, on the line of the railroad, is a large, poor gravel bank, and two miles in another direction is a small, good bank; but with all the teams that could be procured it was not possible to haul the material as fast as it was needed; and it was expensive—one dollar per yard—delivered. It was evident that other and good material must be obtained in large quantities. On the line of the railroad three miles away is a large trap-rock quarry. Refuse in the shape of iron-stone, soft rock and some dirt is accumulated in large quantities. It was believed this stone would mix well with the material which was on hand and could be purchased after it had been passed through the crusher to a 1½-inch size, at 60 cents per yard delivered, and in quantities up to 150 yards per day. About 50 yards of gravel and 50 yards of clean, sharp sand could also be procured each day, and as much ashes from the works as there were teams to put on it.

The question of piling was considered, and by some might seem the only wise plan under the circumstances, but after consulting the leading local builder who had worked on this quicksand for thirty years and had erected some very heavy factory buildings on it, it was thought best to put in a combination filling of the above-named materials.

The quicksand is found hard packed and not easily dug, unless water is allowed to mix freely with it. Although the excavation was in places much below the level of the brook, little water was encountered, and quite as much came from the land as from the brook side. By keeping the bare spots well drained the men could work on the quicksand with a degree of ease without sinking in very deep; the less it was disturbed, however, the better off they were. Over these bare spots it was decided to lay plank close together lengthways of the holes, and upon these 8 by 10-inch timbers, 8 inches apart, crossways of the holes. The filling between the timbers was of pieces of bricks and old retorts broken up fine, that being the best material at hand just then. One of the bare spots being narrow and long, the surface was covered with large flat stones, the smaller spaces being filled in with fire-bricks and coarse ashes.

While working at this low level a pump was run night and day; also from these quicksand spots a 4-inch tile drain was laid to a central point to facilitate drainage and keep the mass from becoming spongy while the tamping was going on and each course of filling was laid.

Until the whole surface approached a level no roller could be used, but everything put in was thoroughly rammed and sprinkled. The layers were about 3 inches thick over the whole surface. When the valleys were evened up a two-horse 4,000 lbs. roller was put on, and as the thickness became greater this roller was increased in weight to 6,500 lbs., requiring four horses. When the level of filling had been raised above the natural water level the pumping was dispensed with over night, allowing the foundation to be saturated, but it was pumped out again in the morning.

Near the centre of the foundation a loose brick well was built up, into which the water ran as the foundation was successively wetted, and from which it was pumped to the brook. There were some high knolls of gravel not over 3 feet under the surface. It was thought at first that the 5-feet concrete side wall foundation might rest on these, but further consideration convinced the company that this was not advisable, as part of the foundation would rest on natural gravel, while most of it would be on filled ground, so the whole level was raised 1 foot to allow of the same kind of cushion underneath the whole structure before the 5-feet circle was started.

* From a paper by Mr. C. A. Learned, read before the New England Association of Gas Engineers.

The layers spread each day over a diameter of 125 feet were about as follows:—125 yards of quarry refuse, 40 yards of good gravel, 50 yards of works' ashes. Towards the end of the work the ashes were exhausted. Near by was a bank of 500 yards of sand, and from this was taken what was needed to make the top dressing under the concrete, spreading on the stone, washing it in and carefully rolling. Toward the end the roller worked night and day.

Near the edge where the wall of concrete was laid, there was a space that could not be rolled, but had to be filled and tamped to a depth of 4 feet. In order to make sure that this portion was as solid as the centre, a round tapering bar 5 feet long was driven into the cement, 2½ of sand and 5 of stone. The size of stone was 1¼ inch and smaller. A great circle of concrete 4 feet wide and 1 foot thick was laid 5 feet below the finished top. On this circle was laid a ring 3 feet wide at the bottom, tapering to 2 feet 9 inches wide at the top, and 3 feet high; resting on the ring was laid, over the whole diameter of 118 feet, a layer 1 foot thick, trued to prelect level and plastered smooth. This work was accomplished in eighteen days, and in a most satisfactory manner, a local engineer taking the job at 4.90 dols. per cubic yard laid. As soon as the foundation was ready the iron men were on the ground, and the holder was erected complete in a week less than the specified time of four months.

PAIR OF SEMI-DETACHED HOUSES ON A NARROW SITE, TORONTO.
F. F. SAUNDERS, ARCHITECT.

main foundation several times. Seventy blows on the average were required to drive it 4·5 feet, and the outside ring was tamped until it equalled the above test.

The amount of material removed approximated 2,900 yards. The work of excavating and filling ready to begin concreting took twenty-two days, and six days more were required to fill in around the great circle after the concrete wall was 4 feet high. This, however, did not delay the concreters in their work. The filling was as per the following amounts:—Quarry stone refuse, 1,780 yards; gravel, 680 yards; sand, 310 yards; ashes, 1,100 yards; total, 3,870 yards.

On this foundation was laid 630 yards of Portland cement concrete, in the following proportions:—1 of

In order to prevent the action of the brook eating away the bank near the holder, a stone wall 7 feet high was built to the level of the holder foundation and 400 feet long, protecting also a new purifier building near the brook. City water was used to fill the tank, as the brook water contained acids. It took three and a half days to fill the tank, which holds a little over 2,000,000 gallons. Before the water was put in careful levels were taken on eight points of the foundations. After filling levels were again taken, and there was not the slightest settlement.

The Montreal Silicate Brick Company, has been incorporated, with a capital of $100,000.

BY THE WAY.

The present popularity of all kinds of athletic sports calls for the erection of tiers of seats for the accommodation of the enormous crowds of on-lookers. That great case should be exercised in their construction is evidenced by the accident which took place in Glasgow recently, when 21 persons were killed and 250 injured by the collapse of the "Grand Stand" during a foot-ball match.

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The Chinese have been demolishing walls outside the Summer Palace at Pekin, and selling the bricks to the various Legations where building is going on, the Ministers being in ignorance of where they were obtained from. But Nemesis sometimes overtakes even the "wily Chinee," says the British Clayworker, and investigation has led to the arrest and punishment of six of the offenders. The Legations ought now to be invulnerable, since sacred bricks have been employed in the'r fortification. When we come to reflect on the matter, however, the Ministers must be an extremely ignorant body not to know a new brick from an old one—perhaps they winked at Master John whilst the transference to their own abodes was taking place, bricks being particularly scarce in Pekin just now.

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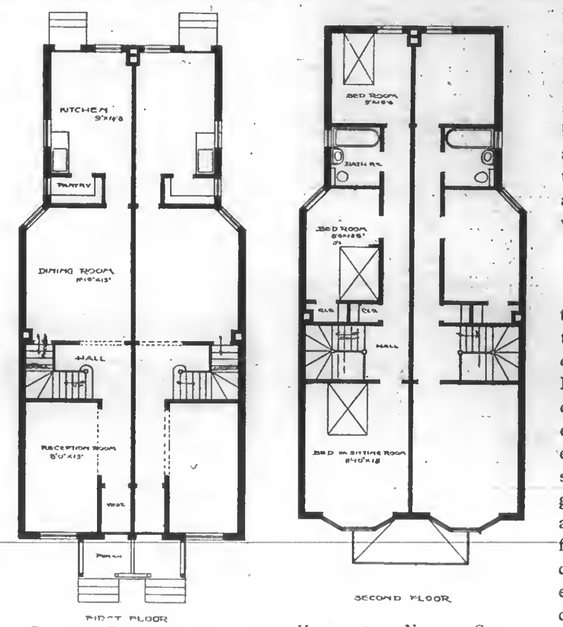
A verdict for £150 was recently given by an English jury against the proprietor of Her Majesty's Theatre in London in favor of a person named Davies who was injured by slipping from a 6 inch step while hurriedly making his exit from the building. The Builder points out that this should serve as a warning to architects not to plant a door on the top of a 6 inch step so that the fact of the existence of a step is only visible from one side of the door.



PLANS OF PAIR OF SEMI-DETACHED HOUSES ON A NARROW SITE, TORONTO.—F. F. SAUNDERS, ARCHITECT.

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Some twenty five years ago a friend of Mr. Aston Webb's wrote a little ditty which described the progress of a young man who started as office boy with a builder and passed through the various ranks until he became an architect. When he reached the position of clerk of works the ditty described him thus:—

When builder's work he found it tame,
So clerk of works he next became;
The work was less, the wages more,
And he liked to boss the contractor.
He wore a two-foot rule and suit of grey,
And now he is a F. R. I. B. A.

× × ×

The Monetary Times contributes the following to the long catalogue of unreasonable demands of the labor unions:—"We know of a case in an Ontario city last autumn where a block of brick buildings was in process of erection, and some bricks of peculiar wedge-shaped form had been ordered from a brick works to be ground to pattern by machinery. The architect was on the structure one day, and a delegate from a labor union came to inform him that these tapering bricks must be ground down by hand—the Union said so. "But," said the architect, "there are not enough bricklayers in the city to contruct before the snow comes the buildings already under contract; why do you want to delay by putting hand-work on these bricks?" There was no answer but the irrational one, that it was the Union's ultimatum. The architect, who is not a patient man, ordered the walking delegate off the works, using a Shakespearean phrase, and declining to be bullied. But, next day, not a man was at work on the block, bricklayer, carpenter, or plumber. The architect, consistent even in his wrath, went to look for non-union men to complete the walls and other work, when the owner of the building, himself a large employer of labor, interposed and accepted the Union's terms rather than have a strike in his own works.

× × ×

Much of the architectural terra-cotta of the day in the opinion of a writer in the British Clayworker, is decidedly over-finished. Apart from slovenly and careless work says the writer, two grades only of "finish" are possible — right finish, or the full rendering of the intended expression; high finish, or the rendering of vivid expression. These, and indeed all the best effects, are oftener got by rough than fine handling. Excellence in architectural terra-cotta, particularly in ornament, is not attained so much by the cutting of the form, it is rather in the ultimate effect of the mass. The correct finish is about that of a modelled piece, made in the same material employed in bulk on the building, after leaving the architectural modeller's hands, the presser or mould-maker's shop. After the mould is made, the presser or finisher, by the excessive use of sponge, leather, knife and busk, destroys all the life and spirit formerly existing in the work, to say nothing of the false surfaces, which readily flake, on the faces of the wares, worked up by excessive finishing. Look at a piece of direct work; work straight from the architectural modeller's hands, without the intervention of mould, presser, or finisher. Note this in a building, side by side with pressed-up wares; if the modeller is worth his salt there will be life and spirit in the work, attributes too often lacking in the doubtless more highly-finished samples of the moulder's art!

—THE—

CANADIAN ARCHITECT AND BUILDER

A Monthly Journal of Modern Conetructive Methods,

(With a Weekly Intermediate Edition—The CANADIAN CONTRACT RECORD).

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It has been decided to hold the annual convention of the National Plumbers' Association of Canada at Halifax, Nova Scotia, on August 13th and 14th.

Mr. Charles E. Langley, of the firm of Langley & Langley, architects, Toronte, is receiving the congratulations of numerous friends on his marriage to Anna M., second daughter of James White, of Woodstock, Ont. The ceremony took place at Woodstock, on the 12th inst.

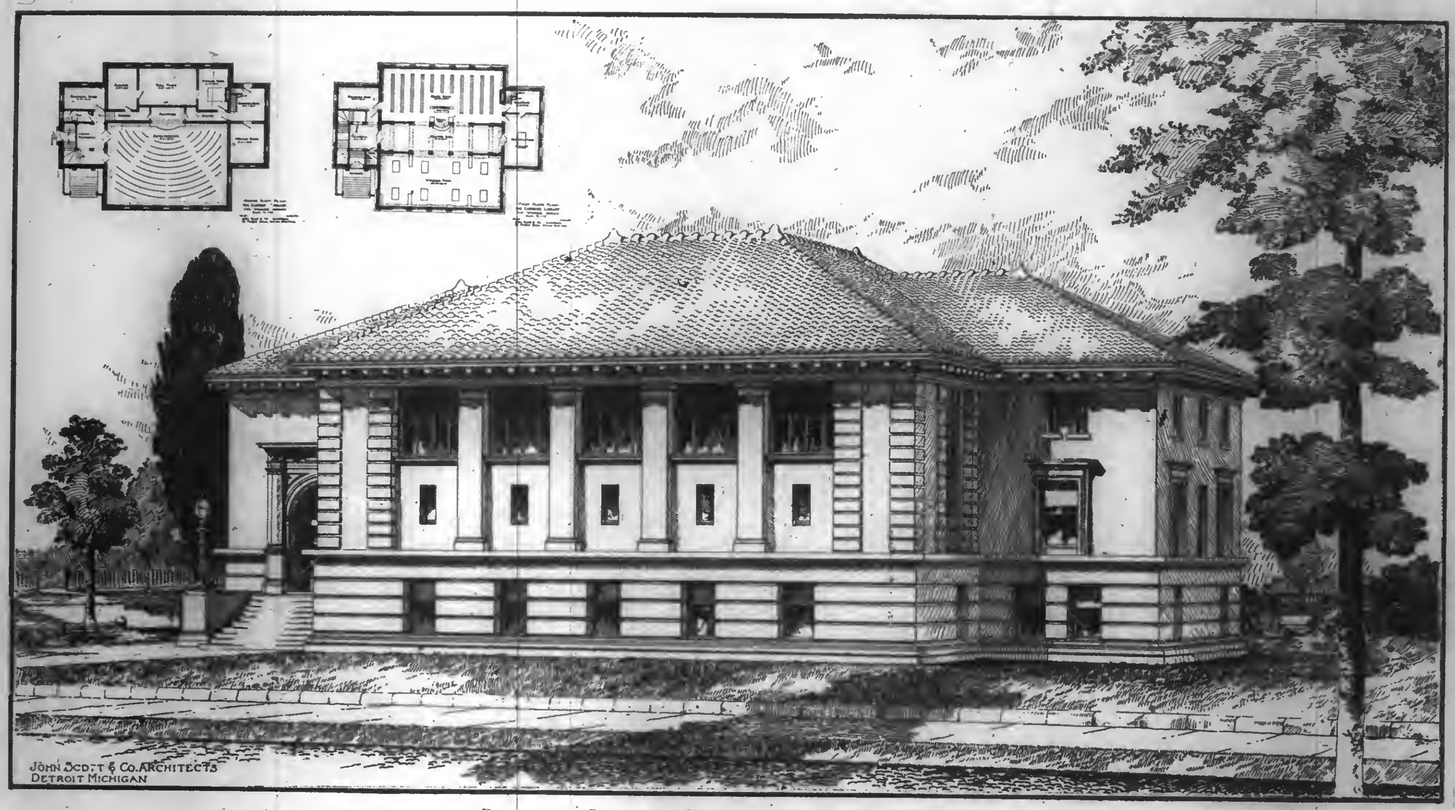
Owing to its remarkable hardness, elasticity and durability, it rivals the best wax finish, but is free from its unpleasant slipperiness.

Moving furniture or boot heels do not leave white marks, nor does soap, mud, or water destroy its fine appearance.

It dries dust proof in about three hours.

Being very penetrating it closes the pores of the wood against disease germs, making it invaluable for hospitals, asylums, and similar institutions.

Architects patronize home industry and specify Granitine Floor Finish.



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JUNE, 1902

House at Cold Springs Harbor, Long Island.
Carrere & Hastings, Architects.

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JUNE, 1902

Design for Lectern.—By G. S. Lemasnie.

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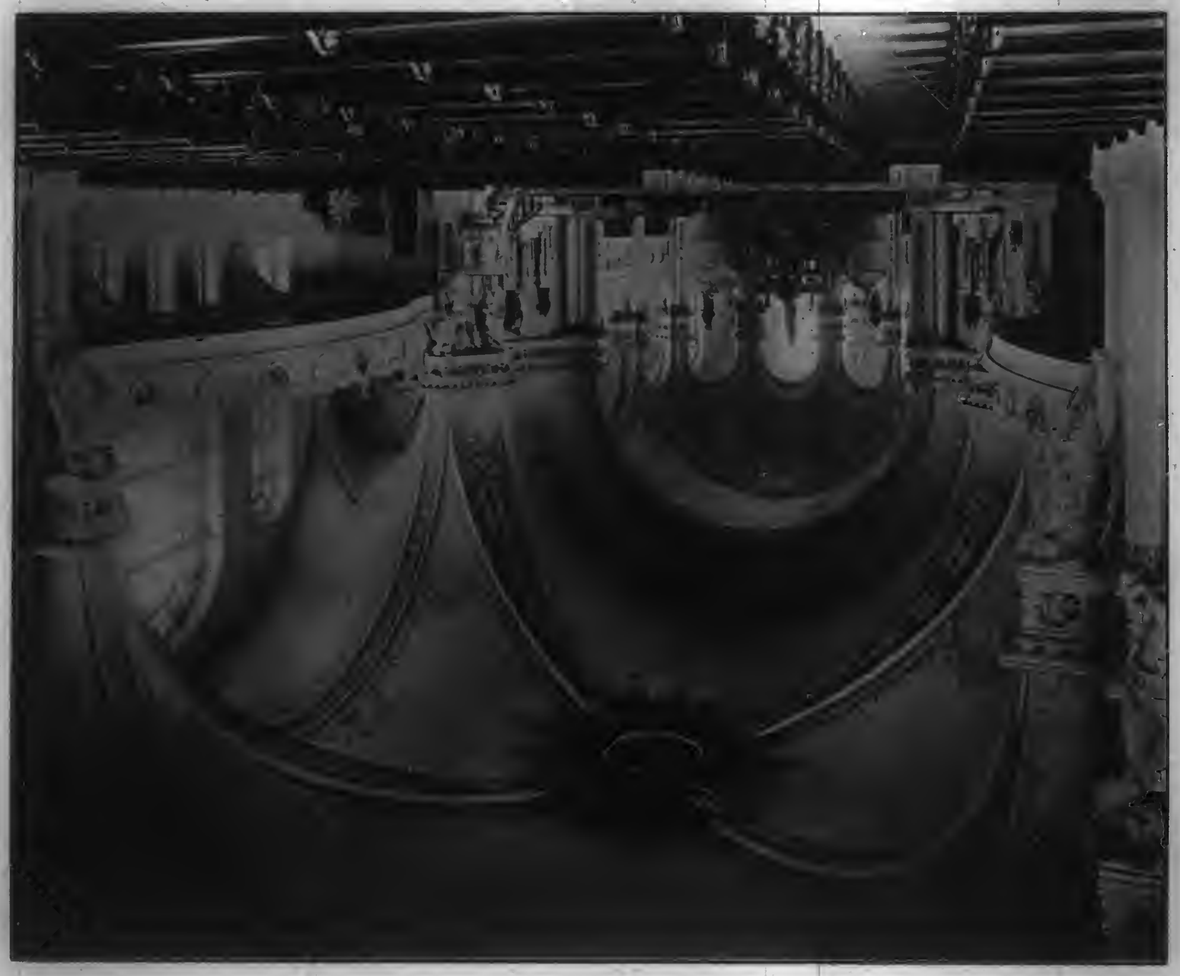

INTERIOR OF ST. ANNE DES PLAINES CHURCH, QUE.
J. VENNE, ARCHITECT.

RESIDENCE, BLOOR STREET WEST, TORONTO.
LANGLEY & LANGLEY, ARCHITECTS.

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SUPPLEMENT TO
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SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
JULY, 1902

RESIDENCE OF MRS. T. M. HARRIS, ST. GEORGE STREET, TORONTO.
BURKE & HORWOOD, ARCHITECTS.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
JULY, 1902

VIEW IN HALL, RESIDENCE OF MRS. T. M. HARRIS, ST. GEORGE STREET, TORONTO.
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STORE FRONT, KING STREET WEST, TORONTO.
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The Canadian Architect and Builder

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ILLUSTRATIONS ON SHEETS.

Exterior and Interior Views of Residence of Mrs. Frank Fleming, Bernard Avenue, Toronto.—Bond & Smith, Architects.

ILLUSTRATIONS IN TEXT.

Designs for Buildings for Louisiana Purchase Exhibition, St. Louis.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Two Photogravure Plates—Residence of Mrs. T. M. Harris, St. George Street, Toronto.
Burke & Horwood, Architects.
(NOTE.—Please substitute for above in June number the following :—"Interior of St. George's Hall, Toronto.—Edwards & Webster, Architects. Residence Bloor Street West, Toronto—Langley & Langley, Architects."

CONTENTS

Editorial	81-82	Building in Montreal	89
Notes of a Visit to the New Building of the New York Stock Exchange	83-84	The Slate Industry of Newfoundland	89
Relation of the Architects and Landscape Architects	85-86	By the Way	91
Art in the Public Schools	87	Building Conditions	92
		The Montreal Silicate Brick Company, Limited	ix.

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Toronto City Commissioner.

The City Commissioner's office remains in statu quo for the present but must have a change, soon and the opportunity ought then to be taken to make its organization perfect. An offer has been made by the architects of Toronto to appoint an advisory committee to work with the committee of the City Council charged with the reorganization of this department. The offer was made when it was understood that reorganization was at the point of settlement. The matter was postponed but the offer remains and has been filed for reference. It only remains for some one to see that it is referred to. This is a good offer; one which will introduce into the reorganizing body the technical knowledge that is necessary; and help to make whatever appointment is made a serviceable appointment, settled upon its merits.

The Stability of Walls in Case of Fire.

THE death of five firemen in consequence of a falling wall, at the burning of the warehouse of P. McIntosh & Son, recently in Toronto, shows the need of a provision in the city building law to prevent the construction of walls which are too long for their height and thickness. Walls that depend for their stability upon the stay provided by the floor beams and trusses are a danger in fires. The wall of the old street car shed, which was occupied by Messrs. McIntosh & Son, should never have been built of so great a length without cross walls. The ruins show a wall 40 feet high, running for 145 paces, or about 425 feet without cross walls. The proper thickness for such a wall would be a little over 3 feet; the actual thickness is 18 inches stiffened by a buttress of 4-inch projection, at intervals varying from 16 to 32 feet. Buttress and all the wall is little more than half thick enough. Such a wall could be safely built only because stayed at intervals by joists and loaded with roof trusses; and, when all these stays are taken away at once, with a shock, in the midst of the violent movements of air in a fire, its downfall is certain. It is not possible to tell from the outside how a long wall is braced; and, unless the chief of the fire brigade is to be familiar with the plans of all buildings, he can never be sure that a long wall is thick enough to stay up after the floors fall in. The by-laws ought to have a provision which will assure him on this point, by making all walls thick enough to stand unsupported.

Are Architects a Commercial Necessity.

A notable instance in Montreal recently of a contract to design and deliver a building for a fixed price, which, in the case in question, appeared to relieve a situation of some difficulty, raises the question whether this would

not be the most direct way for building owners to proceed in all cases; whether it would not be better to make the contractor the responsible person, not the architect. Both functions are necessary; but, if the contractor cannot design himself, he can employ an architect. Would the owner be any the worse for this change of relation between the architect and contractor? Would he not be the better by the disappearance of the uncertainty that now sometimes attends the ultimate price of a building? Why should not buildings be built to order, just as clothes are made to order, for a fixed price? A reputable tailor does not fail us in respect of either design, material or workmanship. It is understood that these qualities are to be assured to us at a fixed price, and the tailor's reputation depends upon the faithful fulfilment of the understanding. Why then cannot a reputable builder be trusted to provide us a building to order upon the same terms? A builder's reputation depends upon his work as much as a tailor's! That is true; but does he depend so much upon his reputation? A tailor's unit of production is small, and its period of duration is short however well it is made. A tailor has to make many many coats before he can make a fortune. Patient continuance in well doing is his only hope for this world as well as for the next. But the contractor!—One good contract scientifically scamped will easily yield a fortune, and the result need not show too soon. What is reputation to a man who can make a fortune before he is found out? Wealth—I speak as a man—is the best reputation. The case of the tailor is not an illustration in point. It is but an illustration of the danger of reasoning from analogy.

The architect is then a commercial necessity, to fix and keep up a good standard of work which, were he not the responsible arbiter, would speedily dwindle. Nor would the architect himself, in these conditions, have the stimulus an artist needs.

The Toronto Plumbers' Strike.

The plumbers of Toronto entered into a wage agreement in 1900, which, according to the conditions of the agreement, is "to stay in force until the first day of January, 1904. And should either party to this agreement wish to change, add to or amend the above, they shall give a least three months' notice in writing prior to the termination of this agreement." The men, after a year of the agreement, have struck for an increase of wages after giving three months notice, and say that this is their interpretation of the above clause. The implication that to express a desire for the termination of an agreement upon a certain date is the same thing as procuring its termination on that date is—considering that the consent of the other party to the agreement is necessary for such termination— a piece of presumption which may be warranted by previous occurrences of the kind; but the only sort of previous occurrence of any kind, that will avail to give this interpretation weight in law, is a judge's decision that the date of the termination of an agreement, which has been fixed by the consent of both parties to the agreement, can be altered at the dictation of one; and the most patient research is not likely to result in the discovery of such a decision in the records of English law. The men have no case, and must know it, because the organizer of their own union has visited Toronto to tell them so. Their own common sense must tell them that the employers cannot possibly make a second agreement with them, in good faith, upon the basis of this broken agreement. The employers will feel justified, and will be considered by other people to be justified, in breaking the new agreement whenever they find it expedient to do so. In other words, the plumbers' action in this matter is an injury to the steady development of the condition of labor, and the best thing that their own party can do is to make common cause with the employers against them.

Adding to Another Architect's Work.

In France, among architects of the inner circle, not only is a designer's drawing his private property but even, so long as he is alive, his executed conception. If an owner wishes to add to his building with the help of a new architect he must expect a new design, for the new architect would think it an infringement of professional etiquette to repeat an idea developed in his predecessor's work. As an aid to establishing the permanent relation between architect and client that the profession upholds as the ideal, this practice is a good one. An owner will not be so likely to change his architect for trifling reasons. He will be at any rate most likely to put an addition into the hands of the original designer. But as to the question of a substitute architect evading the awkwardness of working with another man's design by diverging from it in the points which distinguish it, the fundamental value of this phase of etiquette is doubtful. Granted that the owner knows and accepts the consequence of a change of architects, and that his interest in the matter need not affect the question; as a matter only of etiquette—if all consideration is to be centred on the original architect, the proprietor of the design—would not his interest be best served by following out his ideas as much as possible in the new work? Variation is competition; and, if the original designer has any proprietary right in the executed design, it ought to be the right to demand its continuation. Etiquette comes in in the maintenance of good relations between the architects. The quarrel, if there is one, is not their quarrel. A superseding architect owes it to his own reputation as well as to the undefined interest which the original architect has in the design to communicate with the original architect, if they are neighbours, in the same town or association. If he does not feel at ease in his position enough to do this, and cannot explain his position, the presumption is that he is a deliberate supplanter; an offender against, not only the original architect of the building, but the whole profession. Of course these remarks do not apply to trifles but to buildings of a certain importance, such as that upon which these remarks are based, which is now being added to in Montreal.

The Campanile of St. Mark's.

As we go to press comes the news that "the detached bell tower of St. Mark's church of Venice which was founded in 888 has collapsed utterly". This can only mean a total fall in some manner and to those who are familiar with the importance of the campanile as a feature, not only in the piazza of St. Mark, but as an essential part of the group of buildings seen from the lagoon, this piece of news is of far more enduring importance than that of the resignation of Lord Salisbury and the reconstruction of the British Cabinet. The failure of the campanile must be in the foundations which are the ancient part. The shaft and belfry stage are comparatively modern. Some restoration of the foundation was undertaken less than twenty years ago and a piece of one of the piles that was cut was given to a Toronto architect by one of the engineers in charge of the construction. The pile was of oak and the piece taken from it, though showing the structure of wood and the appearance of oak, is almost as hard as stone. The failure of the foundation cannot be due to the failure of the piles themselves, but to some cause of which we await an explanation with the greater anxiety from consideration of the proximity of St. Mark's and the recollection that its orginal toundation was earlier than that of the campanile.

The Construction of Grand Stands

THE investigation into the cause of the collapse of the Grand Stand during a football match at Glasgow has brought to the surface valuable information with regard to what are the essentials in planning and construction of such structures necessary to insure the safety of the persons who may use them. The problem has become a difficult one in view of the enormous crowds for whom accommodation must be provided. The Grand Stand in Glasgow was an enormous structure, capable of containing 80,000 persons. Unlike the great amphitheatres of ancient times, it was constructed not of solid masonry but principally of wood, steel and concrete. Following are the quantities of material used in its construction: 1,500 lineal yards of fencing, 1,000 tons of concrete for the bedding of the iron girders, twenty-eight miles of pitch pine treads, twelve miles of girders, nine miles of columns, two miles seating, 700 hundred tons of steel, 15,000 square yards tufting, and two miles drain pipes. Between the tiers of seats was a net work of supporting timbers on which the victims of the accident fell and were "broken" in their descent to the ground 40 feet below. The stand appears to have been a substantial affair as such structures go, and the plans were submitted to and approved of by the district surveyor and board. The result has shown, however, that sufficient provision was not made for the tremendous strains imposed by the swaying to and fro within a concentrated area of such an immense assemblage of people. On this point Mr. Edwin O. Sacks, the well-known theatre architect of London, says: "In respect to the terrible accident to the staging at Glasgow, the only thing I should like to observe is that the effect of the moving or live load, such as a crowd of people swaying their bodies but slightly, is enormous, while the effect becomes terribly dangerous when the swaying of the body is accompanied by a shifting of feet. In watching a game in an arena the eyes of every individual in the crowd naturally follow an interesting feature of the game, which may at one time be to the left and at another time to the right of his seat or perch. With the movement of the eyes there is generally a slight movement of the head and upper part of the figure, and at exciting moments the whole body is frequently strained in one or the other direction, and often accompanied by a change of position in the feet. This is done rhythmically by thousands at a time, and the movement thus caused is accompanied by the gravest of risks." It may reasonably be expected that the Glasgow tragedy will lead to the exercise of more exact knowledge and greater care in the planning and building of structures of a similar character, not only in Great Britain but throughout the world.

NOTES OF A VISIT TO THE NEW BUILDING OF THE NEW YORK STOCK EXCHANGE.

Anyone looking at the plan of the New York Stock Exchange will see that it is a rectangle with lugs at diagonally opposite corners—N.W. and S.E. The rectangle runs from street to street in its long direction and the lugs are taken out of the lots to the North and South, which are otherwise completely built over.

The lugs are very useful for entrances, elevators, etc., so as to leave the main rectangle clear for the Stock Exchange; and it is this clear area that in considering either design or construction constitutes the building. Both in the foundation and in the upper flnors these annexes have no share in the great problems of the building, and while we are considering these problems we may dismiss these annexes and look upon the buildiog as for all practical purposes the great hall of the Stock Exchange which occupies the whole rectangle, 112 by 138 feet, inside measurement, and eighty feet high. The 138 feet run from street to street and the light comes from these ends, through the great portico on Broad Street, that we know from drawings, and a plain colonnade of equal dimensions on the New Street side. In addition to these windows there is a skylight in the ceiling. This is at the bottom of a light well for three or four storeys of administration rooms which, appearing as a blank attic above the Broad Street portico form internally and on the New Street side, well lighted offices. This then is the general scheme of the Stock Exchange; a chamber on the ground floor occupying the whole area; several tiers of offices above, which do not appear in the design; and sufficient basement.

It is the sufficiency of the basement that has required most from the engineer and was the principal object of interest in a visit to the works.

As we entered the building the water level was plainly visible, in a trench along the outside, standing at between 10 and 14 feet below the street level. When therefore we stepped on a wheelbarrow elevator and dropped through three storeys of steel beams, for a distance which we found was 42 feet below the ground line, it was evident that, while the building was classic architecture above the street, it must be something of the nature of naval architecture below. And this we found to be the case.

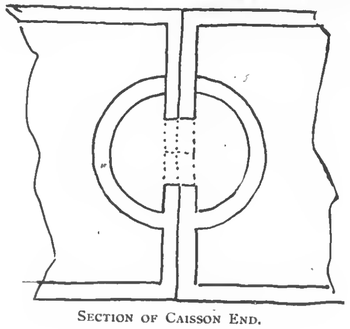
It has been customary of late in New York to carry the foundation down to the bed rock, either as a continuous wall or in the form of piers, excavating for this purpose, by means of pneumatic caissons, the quicksand that lies above the rock. But the excavation for the cellar has stopped short of the water level, which down town is not very far below the surface. At the site of the Stock Exchange the water level, as has been said, was about 15 feet down. A cellar this depth was not nearly sufficient for the elaborate mechanical ar-

STORE FRONT, KING STREET WEST, TORONTO.
SMITH & GEMMELL, ARCHITECTS.

rangements for heating, ventilation, the supply of power and other purposes which will occupy the basements of the Stock Exchange. It was therefore determined to excavate the whole mass of quicksand and gravel down to the bed rock, which Mr. Amory Coffin, Mr. Post's engineer, decided from borings would be found nearly level at about 50 feet down.

The case was therefore not the ordinary problem of sinking a wall to stand in the water. The wall might in this case be very easily sunk in parts, so as to be in effect continuous piers. Where there was water inside and water outside at the same level, an open joint between the portions of wall would be of no moment. But, when the space inside the walls was to be excavated for some 25 feet below the level of water standing outside, it became necessary to devise some means of locking the sections of wall together so as to make them water tight.

The ordinary pneumatic caisson was used 8½ feet wide (the thickness of the wall) and in 15 foot lengths. The working chamber had a domed steel roof, about 8 feet above the cutting edge, and the air shaft rose from the middle of this. The peculiarity of the caissons was that the ends which were square, the better to facilitate square and true sinking, were false ends. The true end was concave for the middle 4 feet, so that when two caissons were put together a cylindrical



Section of Caisson End.

space was left to be subsequently filled in with concrete. The square ends were planed and greased and sunk with great care so that the clearance was as little as possible—from ¼ to 2 inches. Then the middle planks (shown by dotted lines), which had been tapered for the purpose, were removed from the square ends, and the joint between the remaining portion of ends which projected into the cylindrical well, caulked and drawn tightly together by means of bolts. This caulked and bolted joint on the outer side of the wall will be always immersed in water and may be relied upon to be permanent and to keep out water as effectually as the caulked joint between the planks of a ship.

Having made the joint between the sections of the wall watertight the next thing was to attend to the close connections of the footing and the rock, so that this junction might be watertight also. To accomplish this the rock bottom inside the caisson was cleaned and washed and a footing of 6 inch concrete upon this was set under air pressure. Then the working chamber was filled with concrete and a thin grout of Portland cement run in and forced everywhere by air pressure until the pressure held for ten minutes at 20 pounds. In this way also the shrinkage in the wall above the working chamber was made good. Finally the cylinder of concrete connecting the caisson ends of the wall sections was thrown in and the air shaft filled up.

The result has been satisfactory. There is a certain amount of seepage, which is collected in a pit sunk below the cellar bottom and pumped up to the drain.

The deep cellar thus obtained has three storeys below the street level, and Mr. Coffin has made use of these floors as struts to brace his concrete wall against the heavy pressure from without. In order to do this effectually caissons for the 37 steel columns upon which the floor of the Stock Exchange and the three floors below are carried, were sunk down to the rock, and the columns were built in them, while the walls, which have been described above, were being sunk. Thus the walls and columns were both in place before the excavation was begun, and, as soon as the excavation got down to the level of a floor, the floor framing was inserted, and stayed the external walls in place of the stuff which had been removed. The central bays of the floor frame are well cross braced to form an immoveable abutment for the external bays to thrust against, and the ends of the external girders are fitted to a brace girdle of heavy I beams, set with the web horizontal.

The space thus procured under the ground floor is all wanted. The four floors are called respectively the basement, cellar and first and second sub-basements. In the sub-basements are the boilers and engines, the heating, cooling and ventilating plants. The cellar seemed to be chiefly valuable as a free place to run the innumerable wires and pneumatic tubes which are necessary for the elaborate contrivance for saving and expediting work in the Stock Exchange. There is also on this floor a large safe deposit vault, which was a problem by itself. The original vault was of stone. It was determined to leave this as it was, and the caisson sinking and excavation went on around and under it, leaving the vault and an enclosed passageway of approach undisturbed so that its business went on as usual all through the building operations. When it was finally decided to substitute for it a steel vault, the new vault was built alongside ; and the move from one vault to another made between Saturday afternoon and Monday morning, so that the vault was not out of working order for an hour.

The cellar and sub-basements set free the basement, or storey on a level with the street, for the telegraph offices, locker and toilet rooms and other supplementary needs of the Stock Exchange, so that the main floor and entrance may be kept free for members. The two or three hundred employees will have a basement entrance of their own and basement passages to their elevators, so that the employees and members need never meet in coming and going and, as far as planning can bring it about, the Stock Exchange will go about its business in a dignified manner.

The great room of the Stock Exchange is chiefly remarkable, in point of constructional detail showing in its unfinished state, for the trusses of 112 feet span to carry the four storeys of offices on each side of the light wall. The trusses are therefore on each side of the skylight in pairs, each 15 feet deep and 4 feet wide on the flange. Being 80 feet high they do not look excessive.

The entire walls were being covered with marble when we were there. The entire space behind the columns of the portico is to be filled with plate glass. For this purpose steel mullions are inserted behind the columns. The mullions are supported from above and, as there is a large surface of wind pressure to resist, they are made of 18 inch I beams.

When the marble and the glass and the ceiling finish are in place one will have to go far to find one single room so large and fine as this.

Store Front, King Street West, Toronto.
Smith & Gemmell, Architects.

RELATION OF THE ARCHITECT AND THE LANDSCAPE ARCHITECT.*

We have been considering the beginning and growth of landscape architecture. Let us now so far forget these facts, both historical and present, that we may conceive of the profession as having attained a recognized membership in the sisterhood of the arts. The reason for thus taxing your imagination is that I may discuss, in a general way, the probable or ideal relation of the architect and the landscape architect. It will be recalled that the last of the 17th century found the architect supreme over house and grounds, but that the beginning of the 18th century found the architect confined to the house, while the grounds fell to the independent charge of the landscape architect. On the one hand, the architect felt that his domain had been usurped by a people unsympathetic in their feelings and incapable in their lack of training to govern that field which he had been compelled to evacuate ; while on the other hand, the usurpers no doubt felt, at least to a degree, the justice of this reproach and were therefore stimulated the more to differentiate their value, first by ridiculing the traditional style of designing grounds, and second, by creating a taste for a new style that in every way diverged from the traditional. Hence, there was little success in harmonizing the two interests which had heretofore been one, for the simple reason that there were two heads for the two distinct departments, working not only independently but even antagonistically. The extent to which this spirit of antagonism still lingers between the architect and the landscape architect is somewhat uncertain. Opinions will vary according to experiences. It is certainly less than it was, but more than it ought to be. It is a question which though easily solved theoretically, must in practice be worked out by the sum of individual experiences. This question has been mooted from the very inception of landscape architecture, and as long as it remains unsettled the related work of the architect and the landscape architect will be inharmonious. There can be no doubt as to the true cause for the continual inhospitality of the architects, for as a class, they represent a thoroughly trained capacity for design, while the landscape architects, as a class, represent quite the reverse. In other words, it is the friction which must inevitably arise when scientific training is pitted against knowledge which is purely empirical. This difficulty, however, is obviously the result of imperfect growth, and will be solved by the gradual specialization of a trained class of men.

But let us return to the main question of the relation between the architect and the landscape architect. Repton, the father of landscape architecture, fully realized the importance of this question. "Where buildings are introduced," he says, "art declares herself openly, and should, therefore, be very careful, lest she have cause to blush at her interference. It is this circumstance that renders it absolutely necessary for the landscape gardener to have a complete knowledge of architecture. This remark proceeds from the frequent instances I see continually of good houses built without any taste, and attempts to embellish scenery by ornamental buildings, that are totally incongruous to their respective situations." The vital importance of selecting the best site and of fixing the grade of the first floor level is seldom appreciated. Upon it depends all consequent arrangement of details, such as the driveway approach, the house garden, forecourt and so on. And as these details in their turn affect and determine all the outlying arrangements of lawn grades, plantations and other units of the whole scheme, the importance of fixing the house grade and site is still more emphasized. Thus while all questions involving the immediate vicinity of the house should be settled in conference, yet such points as these should tend to subserve the interests of the whole arrangement of the grounds: hence Repton's position is, that while the landscape architect should have no official voice in the actual designing of the house, the style and general arrangement, location and disposition of the house and grounds should be officially determined by the necessities of the landscape architect's general plan ; for as he says further, "to my profession belongs chiefly the external part of architecture, or a knowledge of the effect of buidings on the surrounding landscape."

A similar problem, or rather a part of the same problem, points to the logical ultimate of this question. The time was when the architect was also the engineer, the painter, the sculptor, and the landscape architect. But now the architect employs the expert engineer to determine upon the necessities of construction, and to a certain extent, co-operates with the painter and the sculptor—that is, in his building he allots the spaces and positions for the mural decorator and the sculptor, and even determines the spaces and positions for the pictures. In other words, the architect confines himself to the general lines and forms and externalities of the building, while the surface and details are filled in by the specialist. Having decided these questions so as to secure an harmonious division of his general scheme, the sculptor and the painter are independent of further limitations, save that of their own genius.

Now there can be no doubt as to the soundness of this position, of the generalship and supervision which the architect has over the building which he designs. It not only provides for a perfect and harmonious whole, but it secures expert skill for each division of the whole. It needs but the extension of this principle, now universally accepted, to recognize the logical answer of the question under discussion. Here there is the added problem of the grounds. When it is a matter of large tracts of land, such as Central Park, it is no longer a question as to who shall design it. It falls naturally to the landscape architect. In designing such tracts of land, the position and sites for public buildings, statuary, and other objects of allied arts are determined and regulated by the general design. It could not well be otherwise; and it is obvious that the position here indicated applies of necessity to much smaller tracts of ground. Therefore, the logical answer to the question seems to be solved thus: the landscape architect shall decide upon the design for the whole property. For example—the units of treatment both in large and small private grounds are generally the sites for the house, stable and out-houses, and sometimes for the sculptural work; the kitchen and flower gardens, the drives and walks, and the regulations for the grades and levels of the buildings, the planting and drainage systems, and such architectural features as

*Abstract of a Paper by Mr. Geo. F. Pentecost, of New York, presented before the Architectural League of America, Toronto, May, 1902.

summer houses, pergolas and terraces. It is the business of the landscape architect to determine upon these questions, and to so regulate and adjust them that the whole will form an harmonious design. Apart from this, the architect, the artist and the sculptor are supreme in their respective departments.

There is still, however, one side of the problem which can only be solved by the mutual co-operation of the architect and the landscape architect, and that is, the character of the design for the house and grounds. It is not enough that the relative positions should be properly adjusted; the design for the house and the design for the grounds must harmonize by being based upon the same style or idea. It has been suggested that this difficulty, which is the cause of the criticism most frequently deserved when the house and the grounds have been designed by separate persons, will be solved by the specialist, who shall combine the qualities of the architect and the landscape architect. But this will not be the solution for two reasons: First, that the difficulty is more apparent than real, and can only rise under unfavorable conditions, as when one or both of the designers refuse to harmonize by compromising upon small points, or neglect to discuss the problem before settling upon the entire scheme; and second, it is directly diverse to the principle of specialization which is inevitable, and which has been the direct cause of the creation of specialists in this as in every other branch of work. The true solution of the problem rests with the progress and recognition of landscape architecture as a profession. The difficulties with which it has had to cope during its evolution are not a few. In the first place it lacks that constant stimulus and pressure which bear upon a profession based primarily on utility or necessity. Architecture is such a profession, poor or rich, a country must have its houses, both private and public, and consequently the first fruits of prosperity are drawn upon to clothe this utilitarian necessity in the garb of beauty. Therefore, the architects of a country are constantly under this high pressure which produces a high state of perfection. There is practically no fluctuation in the demand for their services, and there is a constant demand for recruits, who must be thoroughly trained in order to compete successfully. On the other hand, landscape architecture is based upon the aesthetic requirements of a class, and that a limited one; it is thus dependent upon the second or third fruits of prosperity, and is, therefore, seldom under high pressure. Its history is marked by a constant fluctuation, varying from positive extinction to comparative popularity. The result is that at the height of its prosperity, some one or two capable men appear who do nearly all the work of importance, while a multitude of small practitioners, entirely without qualifications, spring into a mushroom existence and manage to make a living upon the crumbs that fall from the rich man's table. Never has the demand been sufficiently great or of sufficiently long duration to require and to support a thoroughly trained class of men; hence the heterogeneity of its practitioners. There are so many fields with which it is closely allied, and with which it is, or rather has been, identified, that its actual nature is obscured, and for this reason it has, until recently, lacked a clear-cut and dignified position.

However, the time comes in the history of every art or craft, business or profession, when its growth, heretofore heterogeneous, becomes homogeneous. Its form gradually becomes crystallized, and its position in social or artistic circles becomes fixed. Such a time has now come to landscape architecture. Its power for good or evil is recognized, it has become in name as well as in fact, a profession of good standing; it is recognized by individual property owners, by city, state and national government; it is recognized by the allied crafts and arts, and it has become conscious of the need of self-protection. That this is so needs but the recital of a few facts. About four years ago the Royal Institute of Architects in England elected Mr. E. Milner, Landscape Architect, as honorary member of its society. This was, I believe, the first step taken by any of the allied arts to formally recognize the profession as such. In the United States, Harvard University aad Cornell and Columbia Colleges have lately introduced courses for supplying the profession with scientifically trained men. There is scarcely a city of importance, especially in the United States, which has not only its system of parks, but its official landscape architect. The fact that the United States government recently employed several landscape architects in conjunction with architects to beautify the capital of that country, speaks for itself. Again, it is the exception, rather than the rule, for private or corporate property owners to develop their land without the advice and supervision of a landscape architect. Still again, the fact that the body of architects represented by this meeting considers the subject of sufficient importance to have it represented is convincing proof that it is a subject of growing interest, and finally, within the last few years there has been formed the American Society of Landscape Architects. The formation of this society is an excellent thing; it will tend to consolidate and unify the interests of landscape architecture. It will make the profession tangible, while at the same time it will create a standard of proficiency and compel the necessary amount of specific training for its members. But in itself it is not enough. Landscape architecture is so much a part of or at least so closely allied with architecture, that whatever advances the interest of either must advance the interest of both. Until, therefore, there is not only a theoretical acceptance of this fact, but an active co-operation between the two arts, harmonious progression will be impossible. That this mutually beneficial progression is advisable is beyond dispute; that it does not exist, few will care to dispute. A spirit of antagonism has existed between the representatives of the two arts since the inception of landscape architecture, or what is the same thing, its separation from architecture as a distinct profession.

What progress landscape architecture has made during the last two hundred years, has been made in the face of considerable opposition. That this opposition has been more or less justified, is undoubted. The time has come, however, when the opposition ceases to be justified, and it is distinctly harmful to both professions. This fact is being recognized to-day and gives sufficient reason why landscape architecture is so live a subject among the architects. The fact of the matter is this. Landscape architecture has become a force in the artistic progress of modern life which cannot be ignored. And the question which arises is, inasmuch as the two professions are so closely allied, in fact, so inseparately involved; inasmuch as they, taken

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together or separately, are practically responsible for the beautifying of both country and city life, is it not better that all animosities or rivalry between the two should be buried, and replaced by a broad minded endeavor to consolidate and harmonize the two interests? I need not apologize for speaking so frankly upon this point at this meeting, for presumably it is in the hope of consolidating the two allied arts that you have invited me here. I am the more anxious to speak upon this point for two reasons. First, because I recognize the fact that without the co-operation of the architects of the country, landscape architecture will lose the friendly aid of the most influential and dominating class of artists, not only of this country, but of all countries, for architecture is the life of all the arts, and without it all arts would cease. And second, because I recognize that the particular department of landscape architecture which elicits the interest of the architects is that class of work which landscape architecture has always slighted. I refer to the formal architectural gardens. It is my personal hope that the present revival of the formal garden will be a permanent feature in all future landscape architectural work. There is but one style of garden, namely, the formal garden, and no garden is perfect without its architectural setting. And so while I bespeak the influence of the architects of the country to advance the general interests of landscape architecture, I exceedingly rejoice in the fact that a side issue of that influence will tend to recall and make permanent in this country the undying beauty of the gardens of Italy.

ART IN THE PUBLIC SCHOOLS.

At the banquet tendered by the Toronto Architectural Eighteen Club to the Architectural League delegates last month, Mr. J. L. Hughes, Public School Inspector, had some interesting things to say about the teaching of art in the public schools of Toronto, as follows: "In our schools in Toronto, we are trying to qualify our children to understand, as well as every other department of art, literature and music. The great memorials of the past in the world of art are often the records preserved in buildings. In connection with our schools we have nineteen leagues of art, and above them we have an advisory board consisting of professional architects and artists, who give their professional advice free. So I think in that respect we are pretty well organized with the forces at our disposal. One of the things the Central Art League does is to own as many good pictures as we can and circulate them among the schools. About half the pictures we purchased this year represent great buildings of Egyptian, Greek, Roman, English, and American architecture; and last night I lectured in a school in which these pictures had been displayed during the past week. We like to find out what pictures interest the children, the teachers, and the parents. We find that the parents generally like some picture that has sentiment in it; but I was surprised last night to find that even little children in the primary school liked the front view of the Parthenon better than any other we have sent out this year; and we have sent out twenty-four pictures. You can make what you like out of that fact. This is an age of child study, and that was a revelation to me. We had pictures of sailors and soldiers, and among others a lifeboat scene to show the children what the Anglo-Saxon blood in their veins is capable of. It was a representation showing a lifeboat manned by eighteen men going into a storm that was so heavy that the boat was absolutely upended and the eighteen men fell into the waves and were drowned; but notwithstanding that another lifeboat was manned by men who had seen their comrades go down to death, and went out in the endeavor to save three men who were struggling in the shrouds of a ship. Yet that front view of the Parthenon was the picture the children liked better than any other. A majority of the teachers liked some of the cathedrals the best. I mention this simply to show that your department of art is a department that is intensely interesting. Our Supervisor of Art has for many years set the children of the schools to study the buildings of the city. This week they are to look at the porches and draw the one they personally like the best. Another week it may be a dwelling or tower. The idea is to get the little ones to look for the thing that is to them beautiful. We carry out the same idea in connection with trees and flowers. We like to encourage each child to have a tree which he loves better than any other. I think that every man should have one tree that speaks to him and stirs his soul as no other does. So we try to get the children to exercise the power of choice, and we do not tell them that what they have selected is not beautiful; for every child has a right to its own opinion, and we wish to know what is beautiful to that child this year, so that next year we shall be able to see how far it has gone in its development. We believe that true development must come from within, and not from without, in architecture as well as in every other branch of work."

Mr. Perkins, one of the delegates from the United States, said: "One of the great experiences I have had in these last three days—and they have been full of such from beginning to end—was one which Mr. Hughes gave to me yesterday morning. Besides taking me around the city, he took me to the commencement exhibit of a school of industrial design, where I saw the application of some of the principals of design we have been talking about. In the department where bonnets and dresses were made I saw sketches by young girls which we would have to hustle to keep up with. I was also very much inspired by the sight of a set of Japanese prints in that school, reproducing some of the most wonderful colors in nature, as found on the bark of trees, the slag of waste places, a bit of a mountain side, and other common objects. I saw some of the most beautiful colors reflected in a piece of bark just like what may be found in the Toronto wood. This result is achieved by the Japs because they work from the inside outward, and are allying themselves with nature, and are allowing the forces that are inherent in every one of us to find their legitimate expression."

PERSONAL.

Mr. J. A. Harvey, architect, Toronto, was married June 18th at St. James Square Presbyterian Church, Toronto, to Mary, daughter of Mr. W. C. Pettigrew, of Palermo.

Congratulations are in order and are tendered to Mr. John Wilson, architect, of Collingwood, who was married a fortnight ago to Miss Ethel Rowe, eldest daughter of Capt. Rowe, of Collingwood.

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THE SLATE INDUSTRY OF NEWFOUNDLAND.

As the result of differences between the proprietors and workmen at the Penhoyn quarries in Wales, resulting in the closing of the quarries some two or three years ago, the attention of Welsh quarrymen has been directed to the slate deposits of Newfoundland. Several of these deposits have been purchased and development work commenced. A Newfoundland correspondent of the Montreal Gazette writes on the subject as follows: "It looks as if the export of slate were about to become an important industry amongst us. A Welsh gentleman, Mr. O. J. Owens, arrived here on Monday last from Wales to commence the work of development on a newly-discovered slate quarry at Bay of Islands. He has a life-long experience in the work and after examining the property gave it as his opinion that it was the largest and most valuable deposit in the world. The orginal owner of the claim was R. G. Reid, railway contractor. He disposed of it to Mr. Owens on very reasonable terms, influenced principally by a desire to bring about mineral development along the line of railway and induce a large number of immigrants to come from Wales and help to build up and people this part of the country. Mr. Owens, in order to help on the furtherance of these views, has published a book on the subject of Newfoundland's slate deposits in the Welsh language, and has circulated it widely among his countrymen. The slate quarry at Smith's Sound, Trinity Bay, is now a well-established industry, and is worked principally by Welshmen, who say there is a great future for slate in Newfoundland. Last year 2,000 tons, equal to 6,000 squares, valued at $22,500, were exported. It was shipped to London and Newcastle, where a ready sale at remunerative prices was obtained. The shipping facilities are remarkably easy and vessels of any size can lay alongside within a stone's throw of the quarry, and in perfect safety. The quarry is of immense proportions and there is sufficient material in sight to last for generations".

BUILDING IN MONTREAL.

There is a revival of activity in building in Montreal this year. The increased cost of material and labor is estimated by the Building Inspector at about 15 per cent., but this apparently does not retard to any extent building enterprise, being presumably more than offset by prosperous commercial conditions. The record of new buildings since the first of the present year is given as follows: In January, permits were issued for buildings to the value of $32,615, twenty-eight for dwellings, six for stores, two factories. In February, the value was $33,500, their being thirty-five dwellings, five stores and a warehouse. In March, the value was $499,400, there being seventy-two dwellings, twenty-one stores, three churches, three warehouses and six factories. In April, there were two hundred dwellings, twenty-eight stores, three warehouses, eight factories, one office building and a church, value $536,541; in May 160 dwellings, six stores, one factory and town office buildings, value $262,240.

BLACK PAINTS FOR HEATED SURFACES.—Ordinary paints, when coated on any heated surfaces, as boiler chimneys, smoke boxes, cylinder ends, usually blister and fall from the work. The following preparation wil be found very efficient for this class of work: Procure 3 lbs. lampblack, 3 lbs. black lead, 1 lb. black oxide of manganese, 1 pint japan gold size, ½ pint turpentine, and 1 pint boiled linseed oil. Powder the black lead and mix all the ingredients well together to a uniform consistency and apply two coats as ordinary paints. This preparation will be found very durable, and will not turn white or grey when exposed to excessive heat, the same as ordinary black paints. Procure 2 lbs. black oxide of manganese, 3 lbs. black lead, 9 lbs. terra alba. Mix well together and pass through a fine sieve, then mix to the required consistency with the following preparation: 10 parts silicate of soda (soluble glass), 1 part glucose, 4 parts water. This may be used in a similar manner to the above. It is invaluable to ship and locomotive painters.

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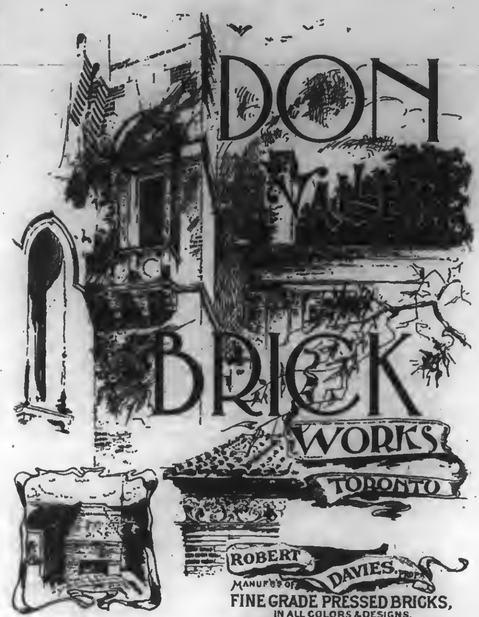
BY THE WAY.

The importance of careful reading of specifications by contractors when submitting tenders was emphasized in Toronto recently. A contractor tendered for certain painting and glazing work for one of the public schools, and was given the contract. He afterwards discovered that in looking over the specification he had read "class room" for "glass room," and in consequence was out more than one hundred dollars in his calculation of the amount of work to be done. He sued the Public School Board to recover the amount, but the Judge held that he was put out of court by the contract.

× × ×

A Canadian gentleman who has lived fourteen years in Chicago, told me the other day some interesting facts regarding the municipal government of that city. He states that with the exception of the parks and the boulevards which form part of the park area, no means are adopted to clean the streets. The parks and boulevards are kept in perfect condition by the money and men provided by the county authorities and are much admired, while by contrast the streets opening into the boulevards are disgracefully dirty. In the face of these conditions healthfulness of the city is said to be maintained by the winds which constantly sweep across it, induced by differences in temperature between the low-lying sandy soil on one side and the water of Lake Michigan on the other. From this cause Chicago has been named the "Windy City." Heretofore the City Government has been largely in the hands of the saloon keepers and appearances would indicate that the revenue from taxes has found its way into other than legitimate channels. The action of several wealthy young men in offering themselves for election to the City Council is an augury of improved conditions for the future.



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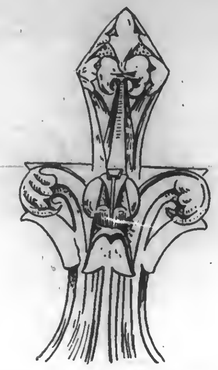

BUILDING CONDITIONS.

In spite of the numerous strikes which have occurred in the building trades, some of which are yet unsettled, the value of new buildings in Toronto for the first half of the present year is about three quarters of a million dollars in advance of the same period of 1901. Nearly half of the increase is attributed to the new hotel and Exhibition buildings, the remainder being principally on account of new residences, of which an unusually large number are in course of construction. A great improvement is noticeable in the new residence work both in point of design, materials, and workmanship. A large proportion of the new houses are being built for the use of the owners, being specially designed and superintended by architects. A considerable amount of speculative building is being done in localities where land may be obtained at a moderate price, but even this work is designed by architects, and is not in the same class with the shoddy productions of speculative builders of ten years ago.

It is gratifying to learn that in Montreal, where building operations have been conducted on a somewhat restricted scale for two or three years past, a revival of enterprise in this direction has set in, while the cities and towns throughout the entire country are likewise witnessing improvements on a scale in keeping with the commercial prosperity now prevailing.

It is to be regretted that workmen and employers cannot unite in an endeavor to make the most of the present favorable conditions, which cannot be expected to continue indefinitely. The numerous strikes to which reference has been made will, if continued, prove the precursor of another period of commercial depression, tempting as they do to render capital timid. We are pleased to note the general condemnation of the Plumbers' Union of Toronto for having violated their agreement with the Master Plumbers. If there does not exist a sufficient sense of honor on the part of the Unions to live up to the terms of a definite agreement such as the one in question, there is small hope that satisfactory relations can in future be maintained between contractors and workmen in the building trades.

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JULY, 1902

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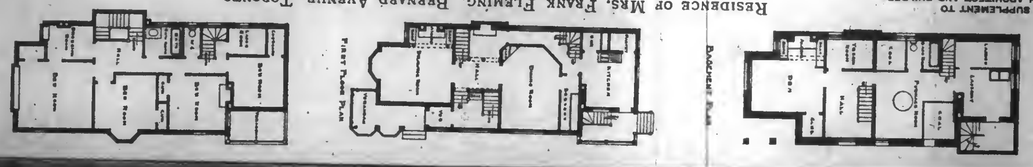

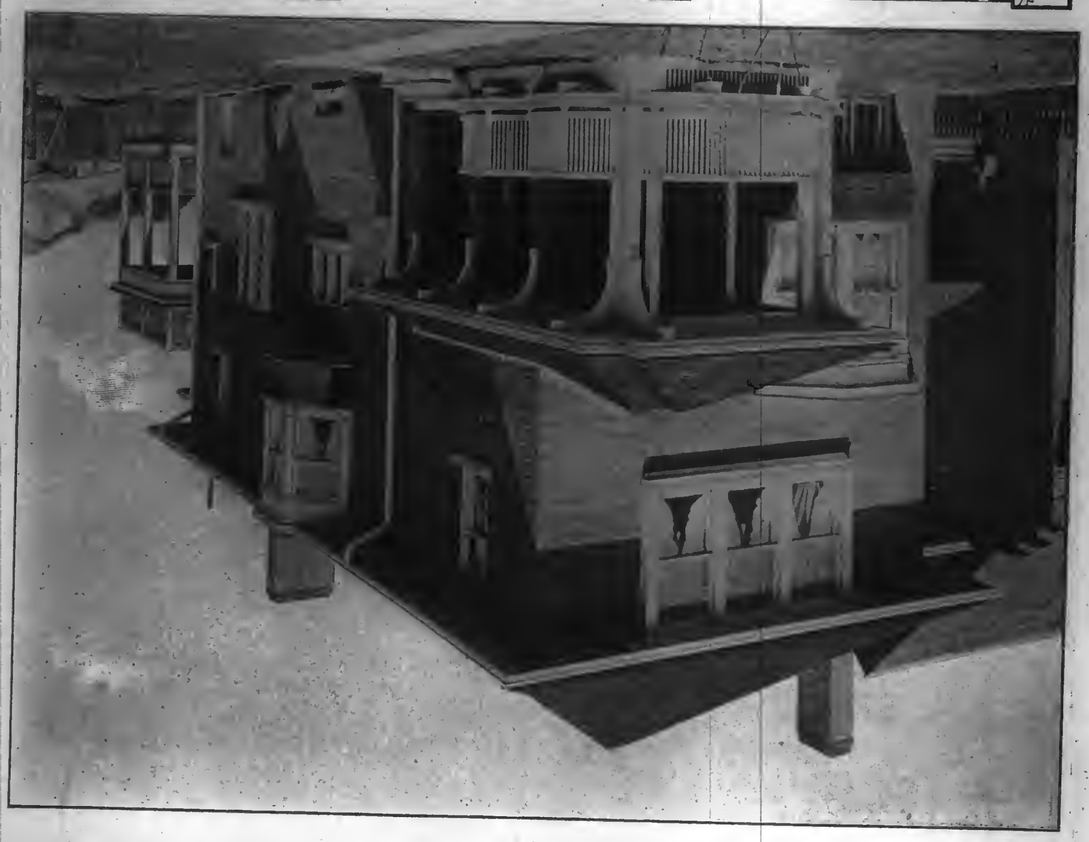

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The Canadian Architect and Builder

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ILLUSTRATIONS ON SHEETS.

House on Bismarck Avenue, Toronto.—W. A. Langton, Architect.

ILLUSTRATIONS IN TEXT.

Canadian Pavilion, Wolverhampton Exhibition of Arts and Industries.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Photogravure Plate—St. James Square Presbyterian Church, Toronto.—Smith & Gemmell, Architects.
Photogravure Plate—Store Front, King Street West, Toronto.—Smith &. Gemmell, Architects.
Apartment House, Montreal.—Macvicar & Heriot, Architects.

CONTENTS

Editorial	93-49	Notes	100
The R. I. B. A. Colonial Examinations a Chance for Architects	95	Volume of Water in Hot Water Heating Apparatus	101
South African Trade	96	Fireproof Bricks	102
The Fall of the Campanile	97	Legal	ix.
Architects as Business Men	98	Building Regulations	x.
The Powers of Architectural Associations	98	A Japanese Exhibition	xi.
Planning	99	Technical Education	xii.
Publications	100	Personal	xiii.

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Cement Blocks.

THE new Dairy Building for the Toronto Industrial Exhibition is well worth examination by architects as an exhibit of cement block walking. It gives the Dairy Building a good architectoric appearance, and suggest the attainment of a characteristic effect, for at any rate plain work. It is rather questionable whether the right result is being attained by casting the blocks in imitation of rock faced stone; but it is remarkable how little the similarity of the blocks, which are of course all cast with the same face, catches the eye. Experience, however, teaches that this treatment will weary in time, if it does not at first. It ought to be possible to give a surface to the blocks, if that is needed, without trying to make them look like stone. If one may judge from the smooth portions of the work—the pilasters, etc., at the entrances—the edges of the blocks are what need most treatment, and attention would be well devoted to the joint.

Municipal Bungling.

WHILE the newspapers are continually urging the advantages of municipal management of public utilities and depicting private contractors in the light of robbers of the privileges and hard-earned dollars, of the citizens, the cold facts do not bear out their assertions. On the contrary, it is the case, in Toronto, at least, that every public undertaking placed directly under the control of the Council in recent years has been badly bungled and has resulted in loss of the public funds. The latest example is to be found in the new Exhibition Buildings. The contract for the structural steel work for the Main Building was awarded last February to the Canada Foundry Company, whose tender was the lowest. The Council was subsequently prevailed on to call for new tenders, which resulted in considerable loss of time. The Canada Foundry Company's tender again proved to be the lowest and was accepted. A further delay ensued while the Council listened to deputations from the Unions who wanted changes made in the specifications on which the tenders were based. This the contractors rightly refused to permit. Then changes were made in the drawings, necessitating the re-cutting of some of the structural material. As a result of these causes, two months of valuable time were frittered away, and the contractors were compelled to notify the Council that because of the delay, for which they were in no way responsible, the building could not be completed within the specified time and would not be available for this year's Exhibition. The St. Lawrence Market Building is another such example of municipal bungling. The citizens have to a large extent lost confi-

dence in municipal management of any enterprise larger than a peanut stand, and will be very slow indeed to vote for any further projects involving large expenditures under the direction of the City Council. Municipal management is perhaps beautiful as a theory, but in the light of practical experience, it must rank as a dismal failure.

The Flat Iron Building.

It is quite possible to get tired of seeing pictures of New York's Flat Iron Building, which represent it as about 10 feet through and twenty stories high. The plain fact is that this is an illusion, a representation from a trick point of view. The building is at the junction of two streets which meet at an acute angle. It has therefore converging sides, and as the point of convergence is rounded the ground plan is like a flat iron. It is in the rounded end that the interest lies for sensational picture makers. As every foot, in such a site in New York, is precious, the end is carried out to as small a round as is at all serviceable inside, and this, for the height of the building, is pretty sharp. Now, if the spectator takes up a position where he just loses sight of one side, he seems to be looking at a building which is of the size of the side in view and only as thick through as the rounded end. It all lies in the plainness of the round and in this point of view. It is just like American journalism—which regards facts only as something to be rummaged for possibilities of startling copy—to always represent the building thus, without a word. The illusion is interesting, but why not explain that it is an illusion? Something like the following would do, "This building, though in plan like a flat iron, can, by choosing a judicious point of view, be made to look like a washboard. See our illustration."

Toronto Island Park.

The latest intelligence about the Island improvements that are going to make Toronto the Venice of America, the Mecca of summer pilgrims, the convention city, is that the Park Commissioner is to take a little run of a fortnight to see what he can see and when he comes back he will settle the matter. By all means let Mr. Chambers go for a trip. He probably works hard and deserves a change. He may perhaps learn by travel what a park is like, and stop spoiling the sweeps of the Queen's Park and High Park by dotting them with his little, spikey evergreens. But what nonsense it is to talk of his taking a little trip and coming back prepared to design a park and lagoons for the island! The suggestion is his own. He accounts for his failure to produce the plan he undertook some months ago to make, by saying that he must go away first to see other places. It is a fatal error to suppose that the assembling together of ideas picked up in different places is a plan. The assemblage remains a mere assemblage even if the ideas are suitable, which they are not likely to be. At the best it is a bric-a-brac park; at the worst it is a hodge podge. What we want is a design; something that has character throughout; something that has lines; something that lies in masses; a park of which the details seem to suit itself, and do not remind one of something else. Is Mr. Chambers likely to learn to plan such a landscape by running round the parks of the United States for one breathless fortnight? Let us get down to business, by employing somebody to design who can design; and let Mr. Chambers keep in order what is designed. That is his proper business.

The Toronto Exhibition Buildings.

Now that the new exhibition buildings are in place, it is evident that they are not in the right place. The art gallery and the dairy building lie, with reference to one another, in a manner that can only be described as higgledy piggledy; and the dairy building is so placed as to cut into the axial avenue which, in the plan of the Toronto Chapter of the Ontario Association of Architects, it was shown to face. This plan was accepted and filed. It was ingeniously laid out so that the new buildings would both face the present winding roads conveniently, and yet be found properly placed, when the time comes that there is somebody in charge with larger ideas, and the avenues are widened and made more stately. The plan has been inaccurately carried out, and every deviation is an injury to the grounds. The worst offence has been in moving the main building west, far enough to set it hard upon the edge of the future main avenue. Of course the road will now have to deflect so that the building may be properly set back from it. This means that there will be no view of the lake down that avenue, as was intended, and as there ought to be.

However, the main building is wrongly placed in any case. It is easy to see now, after the walls are up, that it is out of place altogether where it is. To place a building 350 feet long so as to block, for half the Fair, the look out to the lake, which is the feature of the site, is a fundamental error. It ought to be where the old main building and the horticultural building now stand. Query: As the new building is mostly iron roof, how would it pay to take it down when the old building is condemned with its final condemnation, and put it up again where the old building stood? A better plan would be to stop the new building where it stands—the walls about complete but no roof yet on the ground—and when the Fair is over for this year make a fresh start, by pulling down the old main building and the horticultural building and moving the new main building to their site. This may sound outrageous, but in the end the $15,000 that it will cost will be well expended. The building will be put where it can be left; and, in any case, a proper arrangement of the grounds is worth more than $15,000 to the city. The question of the Fair grounds is really a serious question for Toronto, and this foolish city hall officialism which makes it impossible to get anything done properly is such a costly game that meditation naturally turns to reflect upon the comparative economy of a staff of first class, well paid, permanent officials. But how are we going to get *that* done?

The Fallen Campanile.

Evidence as to the cause of the fall of the Campanile of San Marco is accumulating and all the evidence points in the direction of a spreading strain upon the walls at the bottom. It is difficult to image how, from any other cause, the tower could collapse vertically as it did. It came down as a tall chimney that is felled by the simultaneous destruction of underpinning all round.

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Howard Walker the American architect was an eye witness, from some distance, of its fall and describes the angel at the apex—the feature of the structure that ultimately lay the farthest from the site—"slowly descend, swaying, but upright"; and members of his family, who were close to the tower, told him that "spurts of lime-dust puffed from the tower about 20 feet up from the ground and that then . . . the base of the tower spread "like the roots of a tree?"

Another witness is an architect who writes to The Builder giving a measured plan of the Campanile which he made 27 years ago. The gist of his observations is that the inner and outer shells, between which runs the sloping ascent vaulted in brick, were tied together by wooden bond timbers some of which were decayed. "In many cases" the timbers were cut out, he supposes on account of decay, and had not been renewed. He noticed "several serious cracks in the structure", which he "attributed to the decay of the bond timbers".

Further evidence is given by the ruins themselves which show:—first, that "large numbers" of the bricks were old bricks—Roman bricks, stamped with a stamp which identifies them as coming from Altinum, a city which was ancient when Venice was new—; and, secondly, that the walls were badly built, in some cases being mere shells,(those jerry building ancients again!) filled in with rubbish.

When one thinks of an inclined plane of brick 3 feet 9 inches wide and 875 feet long (by this English architect's plan) resting its accumulated weight at the bottom upon walls which were badly built of bricks which had already served their term a thousand years ago; which have been suffered to decay behind the concealment of a marble loggia and have been deprived by decay and careless cutting of their wooden vaulting tie; it is no wonder that the base of the tower spread "like the roots of a tree."

THE R. I. B. A. COLONIAL EXAMINATIONS A CHANCE FOR ARCHITECTS.

There is seldom anyone who has had a liberal education who does not later in life wish that he had the chance again, knowing what he now knows of what kind of study would be the best for him to pursue. If it were possible for men to take up their calling for some years before finishing their education there is no doubt that the finishing process would be done more intelligently and with greater interest and profit. Architects of all men find that practice opens their eyes not only to new fields of study but to the need of more careful study of what they have already learnt. In particular is it true that increasing experience inclines them continually to the study of the academic examples. Whereas in their younger days they were apt to think a general acquaintance with the historical styles was all that was desirable for this country, and that more intimate study was better expended on current examples; as they increase in experience, it is current work that receives only general attention and they long, generally in vain, for time and opportunity to study old work even out of books. It is not impossible, even in the midst of practice, to pursue these studies to some effect, but it would require much energy and more method to accomplish anything systematic. A day's work does not create an appetite for evening studies, and without a definite end within sight there is little chance but what these studies will be indefinitely postponed. With something to fix a limit both in time and in extent it is easier to begin and to keep going. Here then is a use for the Colonial Examination of the Royal Institute of British architects.

The examinations consist of two days given to a sketch design; it was an almshouse in the examination of this year. After this there are papers on the following subjects:

1. THE NATURE AND PROPERTY OF BUILDING MATERIALS; their decay, preservation and quality, and their application in building.

2. THE ARRANGEMENT AND CONSTRUCTION OF BUILDINGS, in relation to health, drainage, water supply, ventilation, lighting and heating.

3. SPECIFICATIONS AND ESTIMATING. A specification of the work in various trades. The measurement and cost of building work. The conditions for building contracts.

4. CONSTRUCTION. Foundations, walls, retaining walls, arches, vaults, floors, roofs, etc., and constructive details in all trades.

5. CONSTRUCTION. Construction in iron and steel. Showing underpinning and dealing with ruinous and dangerous structures.

None of these papers would afford much difficulty to an architect. Any practising architect ought to be able, we may gather from these examination papers, to go into the examination hall without preparation and pass with sufficient credit. He might perhaps also pass in the remaining paper—6. THE PRINCIPAL STYLES OF ARCHITECTURE: their features, mouldings, and ornament, so that if the right to put A.R.I.B.A. after his name is all he wants the only thing that need stand in his way is the five days' effort necessary and the six guinea fee.

But this paper upon the architectural styles is worth more to Canadian architects than to be merely an instrument for acquiring letters. It makes the very motive that is wanted to stimulate to continuous application in the study of historical work. The ultimate goal—freedom of design—is not less surely attained if the attention is fixed for a time upon the examination as an intermediate object. The examination, like a half way house, will make the way seem shorter. But its prime use lies in its supplying a fixed line of study and a fixed time for its accomplishment. These are a great help to a lonely student.

If the loneliness could be got over a greater difficul y still would be removed. Association is always a help to students, and will be particularly so to the architect student who has other work to do and to whom it is desirable that this course of study should present as much as possible the appearance of recreation. Why should it not be made something of the nature of recreation, by a number of architects agreeing together to take the examination and meeting together once a week or so to talk over and analyze the characteristics of the styles? Both the Ontario Association of Architects and the Province of Quebec Association have attractive rooms, with conveniences for associated work, and, examination or no examination, this is the sort of work to do there.

There is more reason for meetings of this kind than

CANA... ...ER

merely to give to solitary work the pleasure of society. Association in study both broadens and quickens apprehension. "Iron sharpeneth iron; so a man sharpeneth the countenance of his friend." Several pairs of eyes means several points of view, and united research and united criticism will get to the practical essence of the matter more quickly than solitary study. Moreover it is remarkable how much easier it is to remember what has been enjoyed in common than what has been enjoyed alone. The person who, in reading Shakespeare for the first time, observed that he indulged largely in quotation, would never have been so familiar with these passages if he had read them first for himself. One may read

MR. A. McDONALD,
President Winnipeg Master Carpenters' and Builders' Exchange.

and enjoy without remembering; the thing to fix a passage in the mind forever is its application by some one else to point an idea. Common study will contribute in this way to a common stock of knowledge that is clearer, more vivid and more practical than any member of the body could attain to alone. There is likely to be noticeable results in the way of vigorous design proceed from such a group of associated artists.

It is as artists that architects will meet one another in such a field of work as this, and it seems to be a law that capacity in the individual artist develops only by association. Solitude may nurse reflection, but art is execution and needs contact with the effort of others. The best work in art has always originated from a group of artists. The diverse results in individuals of a group show that association does not weaken character. Artists cannot suck one another's brains. Each man's ideas must grow in their own way, but they grow best in an atmosphere where thought is free. If a school of architecture, however local, could grow from united effort in study, so much the better. We suffer for want of unity; from the dissipation of effect that comes from individualism; and if by any possible means we could attain to such agreement of type in any town that excellence in a building would consist not in being different from its neighbours but only in being more excellent, we should have a town that would have architecture, no matter what the type.

This is looking a little onward from the R.I.B.A. examination, but study of originals and asspciated effort are two things which are apt to go far in results.

SOUTH AFRICAN TRADE.

With the ending of the war in South Africa will come a period of great development in that country and a consequent demand for many lines of manufactured goods. German and Austrian syndicates are said to be forming to exploit the South African market. With cool audacity the continental countries which indirectly supported the Boer cause and obstructed the British, are now seeking to reap the commercial advantages arising out of the conditions established by Great Britain at an enormous cost in men and money. The United States have also been exporting largely to South Africa, and their trade returns for the first half of this year show a substantial increase above the same period of 1901. It seems only fair to her own interests that Great Britain should impose some restrictions in the form of duties on foreign goods entering the South African market, thereby giving a preference to home and colonial industries, which will have to bear a considerable portion of the expenses of the war, and compelling foreign countries to contribute something for the commercial advantages which are the direct result of the long continued and successful struggle conducted by Great Britain. Canadian exporters of manufactured goods should lose no time in establishing trade connections in South Africa, and should be properly represented at the South Africa, British and Colonial Industrial Exhibition to be held in Cape Town from November to February, 1903-4.

Building materials, especially bricks, lumber, doors and sashes, and structural iron and steel are in large demand. The United States have already secured some valuable orders in this line. The establishment by the Dominion Government of a direct freight service between Canada and several of the principal South African ports is a gratifying assurance that this country proposes to secure its share of this trade.

Most of the business must be done through importing agents. Lists of these in the principal towns should be secured, personal letters addressed to them acquainting them thoroughly with the character of the goods to be offered. Exporters should also be prepared

MR. A. McCORMICK,
Secretary Winnipeg Master Carpenters' and Builders' Exchange.

to send samples and submit tests of their materials, as in many instances these will be demanded. Care should be taken to ascertain the financial responsibility of all firms with whom correspondence is opened, before sending goods forward, especially in the case of commission firms among whom there are many "sharks," who make their living out of "consignments". The principal demand is for goods of medium quality and moderate price. Whatever the quality of goods for which orders are secured care should be taken by the exporters to maintain uniformity, otherwise they may not expect to hold the trade.

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THE FALL OF THE CAMPANILE.

The most satisfactory account, which we have so far observed, of the cause of the recent collapse of the Campanile at Venice, is that given by Dr. A. Robertson, a clergyman residing in Venice, who is understood to be the author of some valuable historical works. Dr. Robertson has written a series of letters on the subject to the Edinburgh "Scotsman", in which he states that in 1892 Luigi Vendrasco, associated with the building, reported to the Government the necessity of immediate repairs. Subsequently, a Government commission was appointed to examine the structure. This commission reported that no repairs were necessary. Because of an urgent protest by Vendrasco, the project to install an elevator in the building was abandoned. Later on Vendrasco was removed from his position because he persisted in urging that the Campanile should be strengthened. His successor, a young draughtsman, caused to be removed a line of drip stones extending the whole breadth of the east wall of the Campanile, with the purpose of inserting a band of zinc to prevent leakage from the walls of the Campanile entering the adjoining Loggetta. This is said to have weakened the wall and to have lead to its ultimate destruction. Dr. Robertson sums up the cause of the failure of the building as follows:

(1) Though the walls were thick, thicker, indeed, than I said, for they were not five feet thick, but only a few inches under six feet, they were really not solid. They consisted of two parallel walls of brick, the space, three feet wide, between them being filled up with broken bricks, rubble, cement, stones, etc. Therefore the walls were not so strong as they looked.

(2) The cement used was Istrain lime mixed with sea sand. This lime does not become hard, nor does it adhere well to the bricks. Indeed, in the course of the past centuries it became dry powder. It is all over Venice to-day. It formed the cloud that hid the falling Campanile.

(3) It has been damaged by lightning, by fire and earthquake several times. On June 7, 1398, it was struck by lightning. In 1401, on the occasion of festivities for the Doge Michael Steno, fires were lighted on the platform, and the top was burned. On October 24, 1403, the same thing happened. In 1405, the same thing happened. In 1417 it was struck by lightning, and the new top of wood again burned. On June 21, 1436, all the shops around the Campanile built against it were burned. On March 26, 1511, an earthquake split its four corners. In June 1548 it was struck by lightning. In 1565 it was struck by lightning. On July 10, 1591, an earthquake caused it to shake from top to bottom. In 1653, again struck by lightning. On August 23, 1657, again struck by lightning. On April 23, 1745, again struck by lightning, which damaged its east side serverely, killing many people in the Campanile and near it. This was its last and most serious damage, although it was not till June 18, 1776, that the Republic employed the scientist Guiseppe Toaldo to put up a lightning conductor.

(4) The Republic, seeing its east side to be severely damaged, consulted two engineers of fame and ability, Signor Zandrini, of Venice, and Signor Polene, of Padua, to examine and repair it. These engineers said the whole wall wanted support, and they proposed building a new wall against the old one. This was done. But the new wall was never properly tied to the old one. The two were practically separate, and so the weight of the Campanile was borne unequally, and its equilibrium disturbed.

(5) The ringing of the bells, the firing of artillery, and only three weeks ago the simultaneous firing in the Piazza of hundreds of muskets had a tendency to disturb it. Also the more or less frequent earthquakes that visit Venice.

(6) Twenty years ago one of the corner pilasters of the inner wall, and precisely that at the north-east corner, was seen to be cracked in many places. The authorities of St. Mark's Church, who have charge of the Campanile, as it is the bell-tower, had this pilaster tied up. No more cracks appearing anywhere, the Campanile was thought perfectly safe, and was let alone.

(7) And now comes the critical point. The Loggetta, little marble hall, built by Sansovina, rests against the eastern wall of the Campanile. It had almost a flat roof. To prevent the rain beating against the Campanile and running down its side from entering this marble hall, a row of slabs of stone sloping downwards was inserted in the Campanile where the roof met it.

(8) Only last week, that is, but ten days ago, these stones were begun to be removed, as the rain was somehow getting into the Loggetta, and a lead sheeting was to have been substituted. Instead of carefully removing one stone at a time, they removed half of them—that is, twenty five feet of them. Not only so, but they dug through the new wall of the Campanile, that of 1745, and struck the old original wall, which they found separate from the new, and full of holes and cracks. Whilst working, the old wall slipped down an inch or two. Instantly the cut made was built up, but it was too late. On Wednesday the 16th, it was observed that the new wall was cracked at the north-east corner, above the Loggetta, where the work was begun. On Thursday it enlarged. On Friday it struck across the north-east side of the Campanile, sloping upward to the second window from the ground, then up to the third. On Saturday it passed behind the fourth and through the fifth. On Sunday the situation was, to use the word of an engineer, "desperate," and the Campanile was doomed. On Monday the crack visibly opened whilst we watched it, and the end came in a moment, when the whole structure sank into itself.

The city authorities are censured for having disregarded the repeated protests of Vendrasco, for having permitted the public to approach and enter the structure after the approaching collapse was evidenced by cracks extending from top to bottom of the angles of the walls, and for having neglected to save the precious bronze statues, bronze doors, and marble carvings in the Loggetta. The doors have been found among the debris, also two of the pictures on the ceiling, one by Veronese and the other by Schiavoni. The porch of St. Mark's Church was saved from destruction by a very thick column of red porphyry which stood in front of it, and against which was hurled a huge piece of marble adhering to a mass of brickwork. After the disaster, which fortunately resulted in no loss of life, all the shops were closed, and the city was given up to mourning. A large number of subscriptions have been received for the rebuilding of the tower. The only sufficient reason for rebuilding would seem to be to preserve the most ancient and valuable features of the original structure.

ARCHITECTS AS BUSINESS MEN.*

There exists a belief, as vague as it is general, and possessed of all the tenacity of an agreeable religious faith, that the practice of the architectural profession, that is to say, the designing of buildings and supervision of their construction, is a fine art; that it consists of certain mysticisms, executed largely with pencil and paper, and is governed by an intangible something held rigidly fast by fixed recipes, either of ancient tradition or of modern schools, which must not be contravened; that the architect is a fantastic dreamer, and ability in design and capacity for business are fatally antagonistic qualities, and impossible of friendly association in the same brain; that architects, in order to be good architects, must be steeped in an intoxication of ornamental forms, made respectable by old age; with minds almost closed against progressive thought, and above all, without disciplined mentality or ordinary business habits.

Also that an architect is in some manner a picture maker; one who can tell plausible lies in perspective, or in rendered elevations with accurately cast shadows, with equal facility, and that he may ignore every tenet of manners, customs or of common sense which all other men following any other profession or business, are bound to and do respect. In short, that the architect is a creature of moods and emotions, and as these elements have neither responsibility, quantity nor standard, he is, therefore, himself unaccountable, unsubstantial and unreliable.

This is pretty much a delusion, and although I am aware that it is a dangerous thing to disturb comfortable beliefs for the substitution of disagreeable facts—things which involve readjustment of personal philosophy, and contain a promise of work ahead, because the fallacies are harmful and the causes of conditions that are deplorable and injurious to the profession and its practitioners, and constitute obstacles to the progress of art which are otherwise insurmountable—they ought to be exploded.

The first fact is, that instead of our successful architects as a whole constituting a class of befogged dreamers, they are in reality fully as keen and of as large capacity in the business of money-getting as any other constituency in American affairs.

As we cast our eye over the personnel and work of the architects of the country, of whom it may be said that they have achieved success, we find the number of those successful by artistic qualities alone a minority, so small as to become relatively a negligible quantity. Upon the other hand a large majority have achieved worldly distinction as successful architects purely because of business capacity. In other words, the practice of architecture over which the profession, as such, has not control, has been a business rather than an art. In this connection it is perhaps proper to say that there is also a distinct class of practitioners who, owing their successes primarily to social position, make the simple error of ascribing their successes preferably to artistic merit. Of course, without the quality of business acumen upon their own part, or upon the part of friends or family, the presumed artistic merit would have remained long in obscurity. The only point made here is that these instances should evidently be connected with the majority of business successes rather than otherwise.

While there have been, and are, architects who adhere to the pet delusion before recited and others who have conveniently indulged it for business profit, there are also those who with great sincerity make not the slightest pretense that their successes are founded upon anything other than superior business ability. Of these it may be said that they have no delusions at all, and deceive neither themselves nor others. They were and are business men engaged in gaining money by practising the business of architecture. They employed men of such artistic ability as were to be found, as their business demanded such, and paid them well. Now, there are those who affect to believe that there is something in this last condition which is wrong and reprehensible. I do not share this belief. I can not find reason to reproach those who achieve success because they are forceful business men, provided that they practice their business under fair and honorable methods and do not sail under false colors. I prefer to learn something from the evidence furnished by those examples af many of our architects whose names and works become familiar.

The deduction which I make is that the ordinary belief of a successful architect's composition is a delusion, and that business capacity on the part of the architect, under the organization of modern society, is a prerequisite to his success, and consequently to the progress of architectural art.

The reason for this is quite apparent. The architectural opportunities fall to those who are preeminent for business rather than artistic ability, and thus it is they who build the architecture of the country—good, bad or indifferent. The architect must be a business man first and an artist afterward.

*Paper read by Julius F. Harder, Architect, of New York, before the New Jersey Chapter of the American Institute of Architects.

THE POWERS OF ARCHITECTURAL ASSOCIATIONS.

The Philadelphia Chapter of the American Institute of Architects expelled one of its members for having taken part in a competition in the face of a resolution of the Chapter which condemned the conditions and declared that any member who should become a competitor would be guilty of unprofessional conduct. The offending member applied to the courts to compel the Chapter to reinstate him. The Court upheld the contention of the plaintiff that in passing the resolution the Chapter had exceeded the powers granted by its charter and that its powers were restricted to those specified by its charter. According to this decision associations of professional men are without disciplinary powers, and must therefore be the more careful to enquire into the character of the men they may be asked to admit to membership.

In view of the value of wired or prism glass in windows as a protection from fire, on buildings where fire shutters would not be tolerated, Insurance Engineering suggests that their design be carefully considered by architects, with a view to making them more sightly. The design of the embedded wire might, for example, be made in an ornamental pattern and the size and shape of the prism glass frames be varied to relieve the present monotony. The reduction of the hazard incident upon the installation of these devices is so marked that they are certain to come into very general use, and a consideration of their æsthetic appearance will assist largely in their rapid introduction.

CANADIAN ... STORE FRONT, KING STREET WEST, TORONTO. SMITH & GEMMELL, ARCHITECTS.

PLANNING.

Plan may be treated under several heads, such as (1) axia arrangements, (2) location of rooms, (3) accommodation, (4 hygienic condition, (5) artistic arrangement, or the fine ar principles of planning—all important points to keep in view. The first of these, the arrangement of axes, is a fundamental condition of the planning of all large public or private buildings, but few architects make it a study. The main axis of a building ought to have a relation to sight and aspect. In an elongated site with the narrow frontage to the main street, there would be one axis passing through the entrance hall and through the larger apartment as a council chamber or public hall, while if the site is of large area, and extends laterally as well, there may be two axes crossing at right angles, one at right angles to the front, the other parallel to it extending laterally in one or both directions, and upon these two axes the architect may dispose his chief rooms or departments. The relation of these lines or axes to the aspect or points of the compass will not of course hold in town sites; but for country residences the main axis of the chief receptioo-rooms ought to have reference to those points of the compass from which the most desirable light and sunshine are to be obtained. In the planning of hospital pavilions, asylums, and the like, the importance of sunlight and genial winds is recognised, and in many of our latest hospitals, as that of the Grove Fever Hospital, Tooting, the large pavilions are placed axially due north and south, the effect of which is to secure a south-east aspect and a dry atmosphere to each pavilion or ward. Another axial arrangement is to place the pavilions due north-west and south-east. The architect should make a study of the aspect compass in laying down his plans for buildings of this description. In arranging his windows in domestic buildings it is equally important that he should bear in mind that for morning sunshine the windows should look eastward, for evening sunshine westward, and for evening coolness eastward. It is, therefore, of value that his principal rooms should be so axially placed that their windows may face as nearly south-east as possible. But the main axes of a plan may be determined by other considerations—to obtain a good view or vista from the main entrance, or a suite of apartments, having reference mainly to the interior effect. We only mention the value of an axial distribution that will afford the best aspect, if possible. Not less of moment is the question of outlook. In many buildings, as rounty residences, the main axes of rooms may be determined by a pleasant prospect—hence the importance for the architect to determine the position of his chief rooms on the site before he prepares his plans.

Rooms may be arranged axially in several ways, the two axes being placed at right angles instead of parallel; thus the rooms may be L or T-shaped, just as the axis of one meets that of the other. This gives rise to various juxtapositions of rooms, parallel side by side, or end to end, axially as above, or they may be disposed en echelon, one room projecting before the other. Another way of arranging the main rooms is to so unite or join them that one fits into or interlocks with the other, as when a recess of one room projects into the other, so that both have recesses, but in opposite ends. All these methods are employed in planning to give variety, and to produce external breaks.

The location of rooms is probably the first consideration with the architect, even before he can devote attention to their axial arrangement. Having fixed the position of his main and other entrances and the principal aspects, he sketches out roughly the principal rooms or departments of his plan. This is a work requiring both skill and patience, and probably several attempts are made in pencil before a final decision is made. In actual planning the student will find the sectional paper divided into squares of the scale he adopts of great use and help in massing out his scheme. Under this head there is little that can be said, as each problem of planning has its special location of rooms. The plans we see of houses, schools, municipal offices, and baths convince us how little is systematically done. The novice has one notion of planning: he draws an entrance, and a long corridor leading from it, and places his rooms one by one, regardless of shape or convenience, along this line; but the skilled designer likes to break up his area, to shorten his corridors as much as possible, and to place his main rooms in their positions before he commences to consider detailed requirements. He adopts certain axes upon which his larger rooms are placed, and, in fact, axial arrangement and location of apartments are concurrently worked. His plan presents a scheme of orderly grouping of departments all within easy access of one another, and he attains compactness and concentration with the least labor or indirect means. Other plans show a "beating about the bush"; a want of study of the requirements of the scheme. We at once detect this in awkward positions allotted to some rooms, circuitous corridors, and bad lighting. The scheme as a whole has not been grasped; the best positions are assigned to inferior offices and the like. Every experienced planner can detect almost at a glance the want of principal coherence, and grouping exhibited in a plan. He can, in fact, almost immediately say whether the designer knows anything about the requirements or not. A want of grouping and classification is evident in most novices, plans. They are scattered, disjointed, and regardless of wall supports in the upper floors; but we are not now considering construction, but simply planning, though we would here say there is one real quality in good planning, and that is, it is constructive.

Accommodation, our third point, is too important to be considered in one article: it implies a large acquaintance with statistics and data, the allotment of space or area for special purposes of building as for assemblies in halls, churches, and theatres, floor or seat area; bed and desk area as for hospital wards and schools; all of which involve a study of the leading authorities—hygienic, medical, and other—on these respective subjects. We know of plans for workhouses and schools that have been thrown aside owing to the ignorance of their designers about the area per bed and per pupil allowed in such plans by the Local Government Board and School Board. Without a knowledge of the floor area required in each case, it is impossible to lay down a plan correctly. We may roughly locate the room, but such rough arrangement must be adjusted or modified by actual dimensions before we can complete the plan. In a large building—say, public offices, or a public school—the readjustment may practically necessitate a larger area, or some of the rooms being placed on another floor. No one as yet has thought of compiling areas for different purposes of building, although certain data have been published to aid in estimating buildings such as hospitals and schools by the bed or per scholar. Yet there are certain areas accepted and used in planning that have been authorised, such as the space allowed for each bed by the Local Government Board, or area of floor for each pupil by the Board of Education. The rules for elementary schools are by no means fixed. In the United Stated, for instance, the classrooms in the best schoolhouses of recent construction are about 32ft. long and 28ft. wide, and 13½ft. high, and accommodate 56 pupils seated at single desks, which gives a floor area of 16ft., and an air-space of 216c.ft. for each pupil; but it is recommended by one authority that a classroom should be 32ft. long 24ft. wide and 15ft. high, to accommodate 45 pupils, which gives an area of 19ft., and a cubic space of 250ft. per pupil. In England, classrooms generally are planned to allow 10ft. to 14ft. superficial per pupil—a rather wide limit. In churches, a floor area of from 7ft. super. per sitting to 10ft. or 11ft.; but these figures include the aisles, lobbies, sanctuary, vestry, and choir, and, therefore, do not help the architect much in planning the seated areas. The actual floor-space per sitting is about 4½ft. to 5ft. superficial—that is, allowing the usual dimensions for each seat, or, say, 3ft. from back to back of seats, and 2uin. to 22in. for each person. Nearly every authority publishes its own rules for seat or floor area. Thus the London County Council, under the Metropolis Management and Building Acts Amendment Act, provides for theatres a seating area to each person of not less than 2ft. deep and 1ft. 6in. wide in all parts of the house where no backs or arms are provided, and not less than 2ft. 4in. deep by 20in. wide where they are provided. This allowance is little enough, and only provides per floor area 3ft. to 3ft. 8in. The London School Board and the Local Government Board have their regulations, which the architect has to consider before he can settle upon the plan.

The hygienic conditions of planning have also to be considered. We mean by these the requirements of light and air, ventilation, warming by artificial means, &c. These are matters that we need not discuss here; but the relatinn of doors and fireplaces in residential rooms is not always attended to as it ought to be. We have seen plans and houses in which the living or reception room has its door on the same side as the fireplace—often near the fireplace-wall at one corner, and even more frequently in the wall opposite the fireplace—of all positions the worst, as when the door opens those seated near the fire are at once exposed to a current of cold air, and are immediately exposed to the view of any gazer who happens to be in the hall. It is rather strange that so many architects ignore the right positions for doors both to sittingrooms and bedrooms. How

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STORE FRONT, KING STREET WEST, TORONTO.
SMITH & GEMMELL, ARCHITECTS.

often we enter a bedroom in which the bed is exposed to view from the outside, instead of being placed with its head to the wall in which the door is; but there is no other wall against which the bed can be placed. The simple rule that the door should screen the bed or the fireplace as much as possible is disobeyed, and the inmates exposed to unnecessary draughts or the gaze of the inquisitive.

In our limited space we cannot dwell at any length on the last head of our subject, artistic arrangement, or the fine-art principles involved. Everyone will have noticed, in going over a number of competitive plans, that some are architecturally arranged—that is, the authors have complied with those amenities of plan that go to show them accomplished designers. Great solicitude and care will be shown in the arrangement of the entrance-hall and staircase, in easy, well-lighted vestibules and corridors; and even in the plan of each principal room the author will not sacrifice the convenient approach to his room; it will be well lighted, and be proportioned by a regard to a pleasing ratio of length to width and height; he will study, too, the arrangement of his ceilings, their divisions into compartments by pilasters, by making little adjustments in the positions of his rooms and entrances. Such proportions of drawing-rooms will be found as 18ft. by 22ft., or of dining-rooms as one-and-a-quarter to one-and-a-half times the breadth in length. Then variety and charm will be given to the location of the principal rooms by avoiding square or merely rectangular shapes, and making recesses and bays or L-shaped compartments, which can be managed often by fitting one room into the recessed part of another in the manner we have before mentioned. The pleasure derived from pursuit, or from not seeing the whole of a room or hall at once, immensely increases the mystery and charm of the interior. Other points on which we cannot now enter—such as bay windows, ingles, the arrangement of furniture, &c.—are matters that come under this head, and which may be all made to contribute to the sense of homeliness and comfort.—Abstracted from the Building News.

PUBLICATIONS.

It would be difficult to devise a more persuasive setting forth of a university course of study than is shown in the Biennial Review of the School of Architecture at the University of Pennsylvania. Confessedly planned upon new lines for the purpose of presenting a comprehensive account of the character and environments of architectural training at Pennsylvania, the Review sets forth in detail the requirements of the course from the entrance examinations to the completion of the fifth or "Graduate" year. To this end, typical problems have been selected whose demands are printed in full together with one or two of the best solutions offered in each case by the students. The course in Interior Decoration is represented by schemes dealing with rooms as a whole and by several charming individual pieces, such as furniture, wall papers, lamps and other decorative objects. Supplementing all this work are the courses in drawing from the cast and from nature, the latter especially being represented by several excellent studies in charcoal and water color. The nature of the work done in the related fields of history and building construction, as well as in those more purely academic studies which are essential to a well rounded university course, is of such a nature as to preclude its pictorial expression. The details of these studies are given in full in the text. A limited supply of copies of the Review may be had, while the supply lasts, by enclosing one dollar to the Bursar of the University of Pennsylvania. The book contains about one hundred pages of text and illustrations, the former in a special poster type on hand made deckle edged paper, and the latter on dull calendered paper for the half tones and inset on a special paper for the gelatine plates.

NOTES.

The Gold Medal of Honor of the Royal Institute of British Architects has this year been awarded to Mr. Thomas E. Colcutt, F.R.I.R.A., architect of the Imperial Institute building in London.

Some of the most recently constructed buildings in Paris have cut in the stone facade the name of the architect and date of erection. In passing by one of the best modern examples of good building in a Canadian city we noticed the date deeply cut on the corner stone and wondered why the name of the architect did not appear also. Canadian architects should adopt the French practice in this particular. Their names would thereby be perpetuated, the public would be informed to whom the credit for designs of important and well designed buildings should be given, and an incentive would be given architects to put forth their best efforts in design.

Mr. Harry Hems, the veteran sculptor of Exeter, in a letter to The Building News, states that the chair used for King Edwards' Coronation is a new one designed and made in Paris. He remarks that "the 'design' shows an armchair such as Litchfield would scorn to have shown in his 'Illustrated History of Furniture,' and with nothing individualized about it save the Royal Arms, which occur in the upper part of the back, completely overweighted by a royal crown half as heavy again as it ought to be for its surroundings." He prophesies that visitors from the United States will get duplicates in Paris for their dining rooms at £15 to £20.

The planning of people's baths depends, says Mr. Walter W. Thomas in a paper on the subject, chiefly on the shape of the site available, but as the hall and rooms required may be of any form no unsurmountable difficulties will be experienced with any ordinary site; care, however, ought to be taken to have the arrangements as symmetrical as possible. It is advisable that there should be two entrances, one for either sex, leading into a waiting hall, from which access to the baths is obtained. The bath hall ought to be in sections or blocks, so arranged that they may be used for males or females as required. Should there be ample room at disposal, the size of the dressing rooms would not be too large if made 4 feet by 4 feet 6 inches, and the bath-rooms could be the same size. The minimum size of either rooms should not be less than 3 feet 6 inches by 3 feet 3 inches. The corridors may be from 4 feet to 6 feet wide; 5 feet is a fairly good width if the corridor is not more than 30 feet long.

Whatever may be the criticisms passed on many of the decorations which blossomed forth in contemplation of the Coronation, it seems to be generally agreed says The London Building News, that in the Canadian arch our Dominion friends have produced a novelty, as much by reason of the design as in the lesson which it has sought to convey of the resources of the great colony's territory. Sturdily square, two very tall towers of stout wooden beams rise from the carriageway of Whitehall, allowing passages on each side, between them and the pavement, of the width of a vehicle. They are joined by a massive, very simple arch of wood. On a level with the top of this emerge from the summit of the two towers high white poles, six on each, supporting pointed roofs. The arch, the upper outline of which is perfectly straight, has on its centre an octagonal roof, reaching considerably above the other two, and resting, as do the latter, on white poles. The form of the whole structure is simple, but its best feature is the harmonious colouring. The towers and the arch are entirely covered with plaited straw, fixed by red flowers. Wheat, oat, and barley sheaves are looped round the edge of the roofs. The arch is decorated with plain curved lines of twisted corn on some shiny, crimped stuff of a cherry red. Above, in letters of the same red on a yellow ground, are written the inscriptions, "Canada, Britain's Granary," and "God Save our King and Queen."

Some time ago the well-known French sculptor, Bartholdi, described in La Nature a simple method of ascertaining what dimensions of a proposed monument will produce the desired effect on a given site. A silhouette of the design is cut from cardboard, either a scale drawing or preferably a photograph from a scale model furnishing a basis therefor. If this can be tinted so as to give the tone of the material to be used, so much the better. The silhouette is attached to one end of a piece of soft wire, which is wrapped loosely round a cane, umbrella, or other similar support, so that its position may be shifted back or forward at will. On the site of the monument, just alongside where the base will probably come, is placed a vertical measuring rod marked off into prominent divisions. The experimenter takes his position at a sufficient distance to secure a good general view, and brings up to the level of his eye the support carrying the silhouette, aiming as with a gun towards the site. By shifting the position of the silhouette along the support it may be determined after a while where it produces the best effect, considered as furnishing the illusion of the original structure. By there noting the correspondence in height between any given division of the small design—as, for instance, the top and bottom lines of the die—and the feet or yards on the measuring rod, a scale can be established. This scale applied to the drawing or model will show what the sizes of the executed work should be.

VOLUME OF WATER IN HOT-WATER HEATING APPARATUS.

The volume of water required per square foot of radiating and heating surface, in the radiators, mains and heater of a hot-water heating apparatus, for best results in heating and greatest economy of fuel in operation, is a question which has received some attention in the past, but judging from the differences of opinion, as expressed in their various constructions, by manufacturers of heaters which have been used for heating by hot water during the past twenty-five years, and which are being offered and used at present for that purpose, we are still far from a standard, particularly in the volume of water required in the heater per square foot of heating surface exposed to the fire or heated gases.

In the manufacture of radiators, particularly when they have been constructed with a view to their being used for hot-water heating, the standard aimed at, and finally accepted by the leading manufacturers of radiators in this country, has been one pint of water to the square foot of surface—being approximately the volume of water contained in one square foot of surface of one-inch, ordinary thickness, wrought-iron or steel pipe.

Some radiators have been constructed which contained less than this volume of water, and some which contained considerable more, but in either case these radiators have gradually gone out of use, while new designs in hot-water radiators which have been brought out during the past six years, have largely conformed to this standard, which seems in practice to be the best suited for this purpose for all classes of buildings, except, perhaps, all-glass constructions, in which I have found it to be an advantage (on account of the greater and quicker cooling effect in such constructions, and the variable temperatures at which the water in the system is sometimes maintained, on account of irregular firing, lack of fire-box capacity or lack of capacity in the heater, and on account of friction due to the long lines of piping usually employed in placing the required radiating surface in this class of building) to use a surface that contained from fifty to one hundred per cent. more water, although were a uniform temperature maintained in the water in the heater, and the same arrangement of radiating surface utilized that is at present used for the heating of other buildings with this system, with short circulations, and an ample arrangement of mains, it would not be necessary to increase the body of water in the radiating surface above one pint to the square foot of surface.

CANADIAN PAVILION, WOLVERHAMPTON EXHIBITION OF ARTS AND INDUSTRIES.

At our last annual meeting, during a topical discussion, when this question was under consideration, I mentioned an experiment or test made some years ago, in two green-houses of uniform construction, size 16x100 feet. Each house contained approximately 2,000 square feet of glass and had about 650 square feet of surface or running foot of 4-inch greenhouse pipe; each house was heated by a separate heater located in the same pit, with separate brick flues 8x12 inches, extending 20 feet above the ground. To these flues each heater was separately connected by 10-inch wrought-iron pipe; each had about 4 square feet of grate area and about 90 square feet of fire and flue surface (about half fire and half flue.) The radiating surface was arranged in the usual way for such constructions in 4-inch greenhouse pipe on each side of the house, below the benches, with one flow and two return pipes on each side; an open expansion tank at the extreme end of each line, and each side connected separately to the heater with 4-inch flow and return connection. In one house the 4-inch pipe was left regular and had an internal area of about 10 square inches, in the other house 2x2-inch oak strips were inserted in the centre of the pipes, reducing the waterway about 40 per cent., while retaining the same external surface. In a six-hour test maintaining a 60-degree temperature in each house with an outside temperature of from 25 to 30 degrees, an average temperature of 160 degrees was maintained in the flow mains and 130 degrees in the return mains at each heater. The consumption of fuel was 130 pounds of anthracite coal, stove size, for the house with full waterways in the radiating surface, and 110 pounds of the same coal for the house with reduced waterways, while the temperature on the flow main on the heater with reduced waterways was frequently 5 degrees higher than on the other heater, and the dampers on this heater had to be partially closed to prevent a higher temperature. Later this house was lengthened 25 feet, or 25 per cent., and piped in the same way, and the temperature maintained with the same average consumption of fuel as that used in the other heater with 25 per cent. less surface and glass area.

Since that time I have used largely 1¼-inch pipe, with a little over one pint of water to the square foot of surface, in small conservatories; 1½-inch pipe, with about 1½ pints of water to a square foot of surface, in medium-sized conservatories, and a 2-inch pipe, with about one quart of water to the square foot of surface, in large conservatories and greenhouses in preference to 4-inch greenhouse pipe with about half a gallon of water to the square foot of surface. I have found that I obtained better and quicker results, a greater possible variation of temperature, and greater economy from the use of 2-inch pipe, with manifolds, than from any other size of pipe, either larger or smaller.

In arranging the mains of a hot-water heating apparatus the area of the main has to be determined from the number of square feet of radiating surface to be supplied and the nature of the surface, whether direct, direct indirect, or indirect radiation, and from the length of the main; also, whether the main is to be used as radiating surface or covered, so that no standard as to volume of water per square foot of surface supplied could be adopted in regard to the mains in a hot-water heating apparatus without being subject to considerable variation. At the same time I have found cases in hot-water heating where the area of the mains was from 25 to 50 per cent. larger than was necessary, and they could have been reduced with beneficial results, being made large to insure a uniform temperature in the main, which could have been obtained in a smaller main with a different arrangement of taking off branch connections.

The greatest difference of opinion as to the volume of water required per square foot of surface in hot-water heating seems to exist in the heater, or source of supply.

Beginning with boilers of the Cornish type, which are used in some sections for hot-water heating, they contain about three gallons of water per square foot of boiler surface; then the ordinary horizontal and vertical tubular boilers, arranged for hot-water, have about 1½ gallons per square foot, a number of cast-iron one-piece and sectional heaters have about one gallon per square foot, some have three quarts and others half a gallon; then some heaters of this type, and water-tube heaters, contain from three pints to one pint per square foot, and in some heaters constructed of one-inch pipe, while the volume of water to the foot of surface is not materially reduced, the friction is increased by inserting a sheet of metal, as a circulating division, reducing the pipe to half its area. Now, if we do not consider the Cornish boilers, which are more largely used in other countries, and begin with the horizontal tubular boiler, which is largely used in this country, we have a variation in hot-water heaters of all the way from 1½ gallons to 1 pint of water per square foot of surface, and while all of these different constructions, with their varying amounts of water, will accomplish certain results with more or less efficiency and economy, certainly some will produce better results than others, and on that account would be considered a proper standard; and while the arrangement and location of the surface relative to the fire and heated gases would make some difference as to the volume of water which

*Paper by Mr. M. Mackay read before the American Society of Heating and Ventilating Engineers.

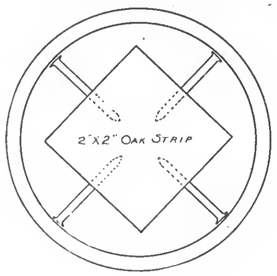
should be back of it, I have obtained the best results from an average of a half-gallon of water per square foot of heating surface in a hot-water heater, with an average of from 20 to 25 square feet of heater surface to each square foot of grate area, the surface being arranged with about 50 to 60 per cent. of fire surface and about 40 to 50 per cent. of flue surface.

DISCUSSION.

Prof. Carpenter: The paper is to be commended as bringing out a great deal of information about the relation of surface to volume, both in radiators and in boilers, and this ratio is an important factor in the successful operation of the radiator or boiler.

If the volume be too small within the boiler the circulation is likely to be bad, particles of steam are thrown out, and the results are poor. With too large a volume the action will be slow, and there will consequently be an excessive demand upon the apparatus.

C. B. Thomson: In manufacturing boilers we have to make one type answer for both steam and water, and we have to pay particular attention to the fact that it is a steam boiler. There are many little problems in a steam boiler, such as carrying a steady water line, carrying a water over into the radiators under certain conditions, and we have to be careful about the waterways and the return column, so as to get good circulation. On that account boilers are sometimes made to contain much more water than would be desirable in a water heater. I believe the



most popular heaters in the market to-day contain about one-half gallon of water to the square foot of heating surface.

If manufacturers built boilers for water alone, ignoring the conditions required for steam boilers, they would produce more efficient water boilers. A hot-water boiler requires small waterways and a large amount of effective heating surface exposed to the direct rays of the fire; also a rapid circulation of the water It is generally known, and I have made experiments which prove it, that with a sluggish circulation, sought to be accelerated by a strong draft, the draft carries away much of the value of the fuel. An easy and rapid circulation is therefore essential.

Mr: Mackay: I would like to enlarge on one subject a little On account of the sun greenhouses require little or no heat during the day time. With 4-inch pipe you must waste your heat to the outer air by opening ventilators during the day. With 2-inch pipe you can lower the temperature more quickly in the morning and avoid opening the ventilators and wasting the heat, and ye you can quickly raise the temperature to the desired point in the evening when it becomes cooler. At our last meeting something was said of the advantage of storing heat, but I think it better to generate heat as you require it and use it as you generate it.

Some people object to hot-water heat in dwellings because it takes too long to raise the temperature in the morning. I have not found it so in properly placed and properly operated apparatus.

The President: Do you use an open or closed heater?

Mr. Mackay: Always open. I can get better results with an open system, and I consider it dangerous and bad to use high pressure when you can do the work with low pressure.

Prof. Carpenter: The question as to volume and surface really comes down to a question of circulation. The smaller the volume on a given amount of work the greater must be the circulation, and it has been pretty well proved that the greater the circulation the greater the efficiency of the surfaces, both of the boiler and radiator. So it really comes down to what is the least practicable limit in velocity of circulation. Personally I favor a large volume of water in a hot-water heater for heating houses, as tending to reduce fluctuations of temperature. We like to put on a fire and have its effect distributed over a long time.

FIRE-PROOF BRICKS.

Theoretically, the ordinary types of bricks made by the clayworker are fire-proof; but, practically, very few of them are. We, of course, exclude perforated bricks in making this statement, says a writer in the British Clayworker. During a conflagration of any magnitude, the inside bricks, especially in partition walls, usually become red-hot. This leads to the expansion of each brick concerned, and buckling of the walls commonly results. This effect is minimized where the mortar has been laid on thickly between each brick-course, as the coefficient of expansion of ordinary builders' mortar is not the same as that of the bricks. In the last-mentioned case the mortar is, in the vast majority of instances, ruined by the great heat at an early stage of the conflagration, though if the wall is a thick one the mortar in the interior of the wall may to some extent be preserved. Cement mortar does not seem to be so much affected as ordinary lime mortar. Where the life of the mortar is sapped, so to speak, the bricks suffer more from the heat, but the greatest amount of damage is done to them by the water from the firemen's hoses. The sudden application of cold water to a hot brick frequently has the effect of cracking it, particularly if the operation be of an intermittent character, which is generally the case. In order to test the quality of a brick for fire-proofing purposes, therefore, it is desirable, amongst other things, to heat it to as high a temperature as possible, and then plunge it suddenly into a bucket of cold water. It should not be allowed to remain there more than say 10 to 12 seconds, and should then be returned to the retort, or whatever the form of furnace in which it was heated for the experiment. This procedure is rather drastic, and many types of bricks cannot withstand it; but it certainly brings out their relative capacity for endurance under extreme changes in temperature. In watching such experiments it will be noticed that whilst many different kinds of bricks crack and split right across, others will simply have a corner or two removed, and a third may merely exfoliate. In the last-mentioned instance the bricks are usually of very fair quality for the purpose. The sudden application of the water to the red-hot surface produces steam, which in its turn exercises a semi-explosive result at innumerable points on the surface. The accumulation of these points locally leads to "starring" and frequently to serious exfoliation.

It is difficult to lay down a law as to what should constitute an ideal brick for fire-proofing purposes, but it is clear that cæteris paribus one that does not become red-hot very quickly, and which does not expand much, should fall into the first rank. At the same time, the brick must be strong, especially for the construction of of buildings in which much ironwork is employed. For, whilst it is in itself being very severely tested during a conflagration, the brick has frequently to bear the brunt of an attack from the iron girders. These latter expand very much during a conflagration, and though when properly built up an allowance is made for this, they are apt to buckle and exert enormous strain on parts of the wall not designed for such contingencies.

Bricks that are not protected in any way by fire-proofing materials, and upon which reliance is solely placed, ought not to be of a soft character except for small buildings where there is no likelihood of a very high temperature arising during a fire. The reason we make this exception is that they are less liable to great expansion during the fire, though they must first have been thoroughly well burnt in the kiln. We exclude nearly all fire-bricks from these observations.

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BAGSHAW V. JOHNSTON.—Action brought in the High Court of Justice at Toronto. Solicitor for defendant Siddall moved to dismiss the action as against the applicant on the ground that no relief can be obtained against him for the cause of action alleged against him in this proceeding to enforce a mechanic's lien. The defendant Johnston is the owner of the property on which plaintiff asserts a lien, and the defendant Siddall was the architect for the owner. This proceeding or action was begun by statement of claim under the Mechanics' Lien Act. The claim is to enforce the lien and also reform the contract between the plaintiff and defendant Johnston, and to set aside the defendant Siddall's certificate or for damages. Held, that defendant Siddall is not a necessary party to an action to realize a lien, for he is neither a contractor nor a wage earner, nor one who has supplied materials, nor is he an owner or encumbrancer. He is merely the architect for the work. If plaintiff wishes to proceed against him he is of course at liberty to do so, but he must not do so under the Mechanics' and Wage Earners' Lien Act, for no power is given to join such a claim under it. Order made striking out the name of defendant Siddall as a defendant, with costs to be paid by plaintiff. Leave to defendant Johnston to make any motion that he may be advised.

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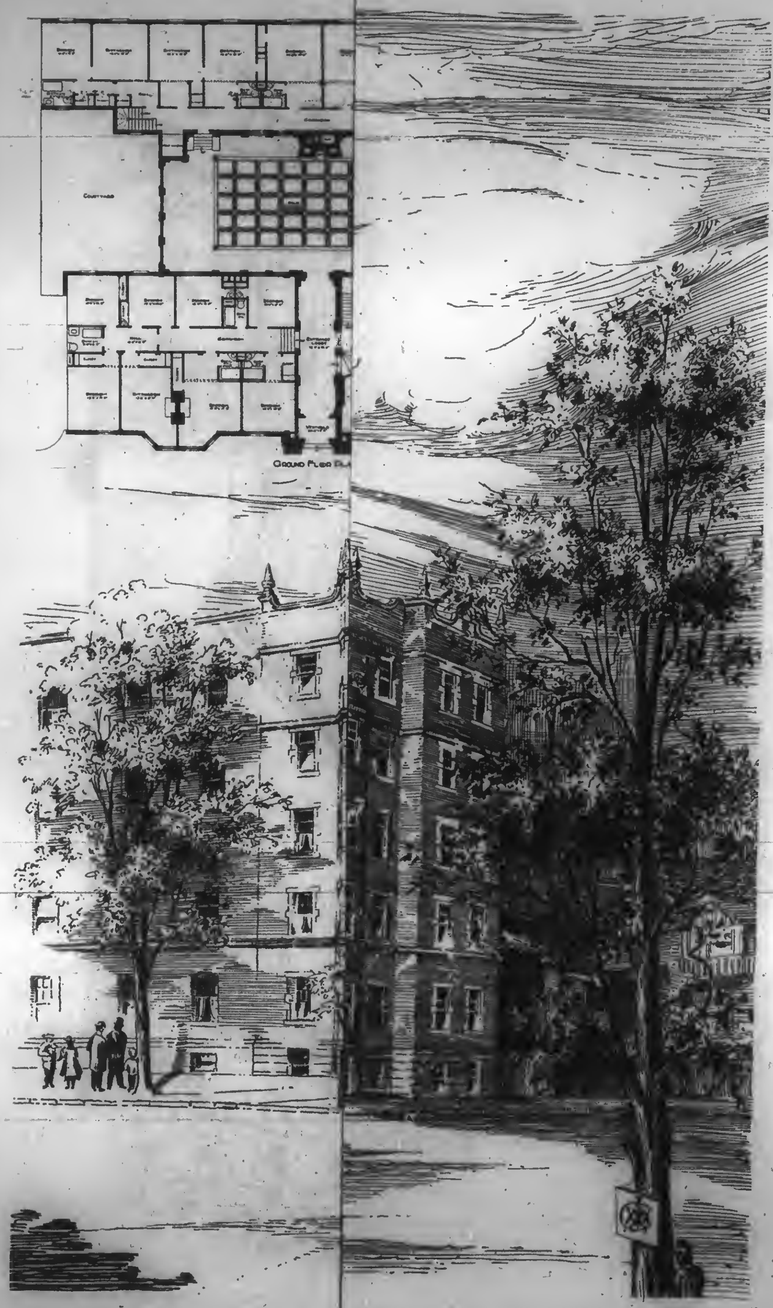

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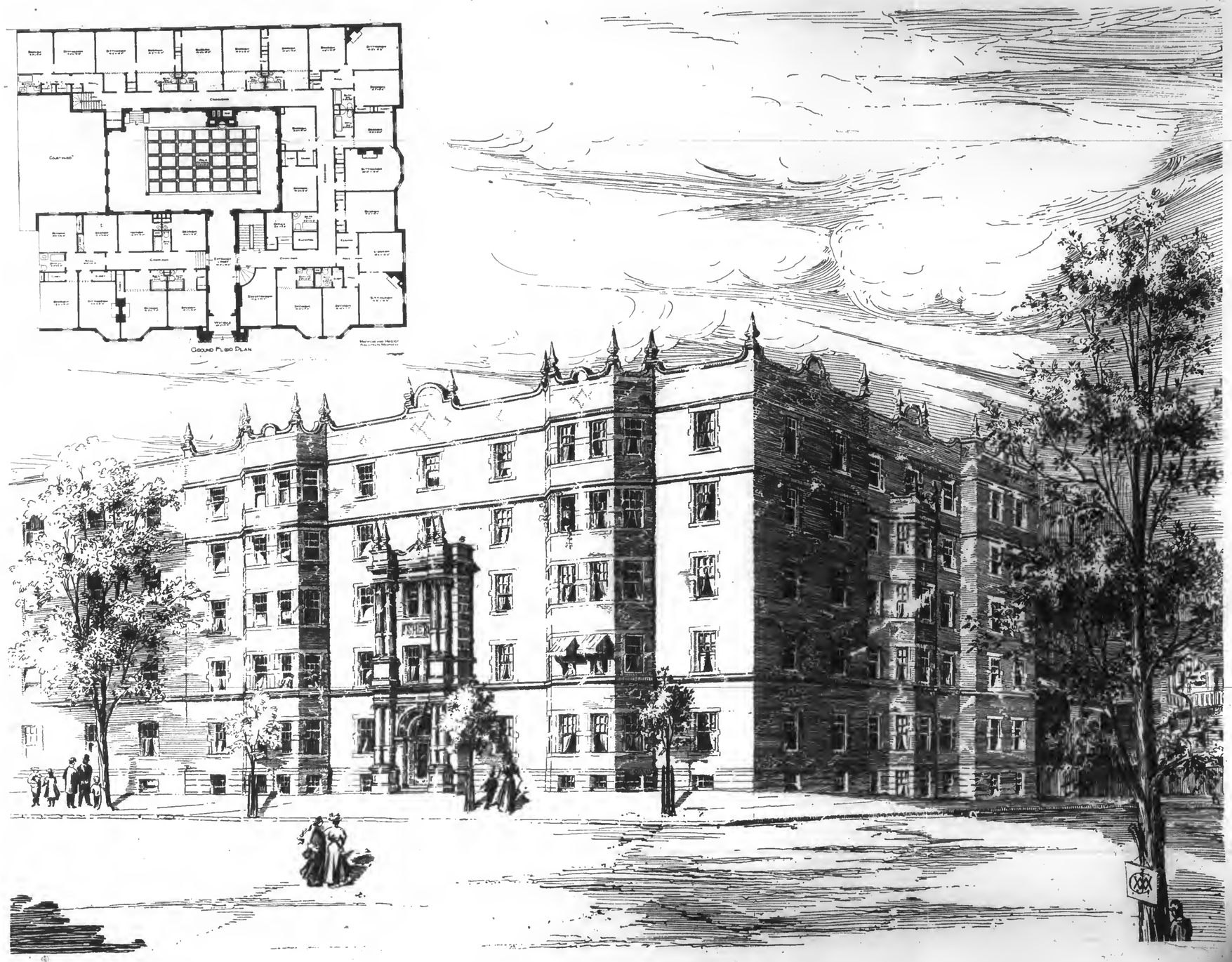

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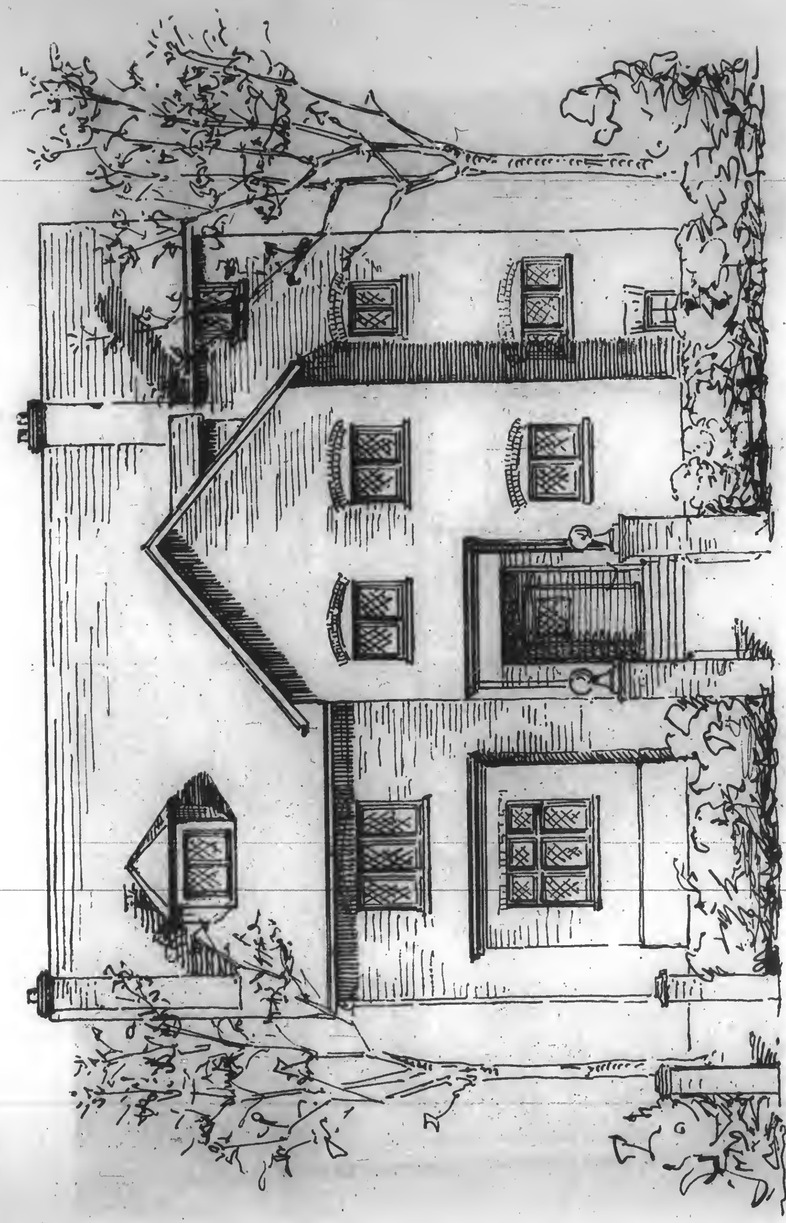

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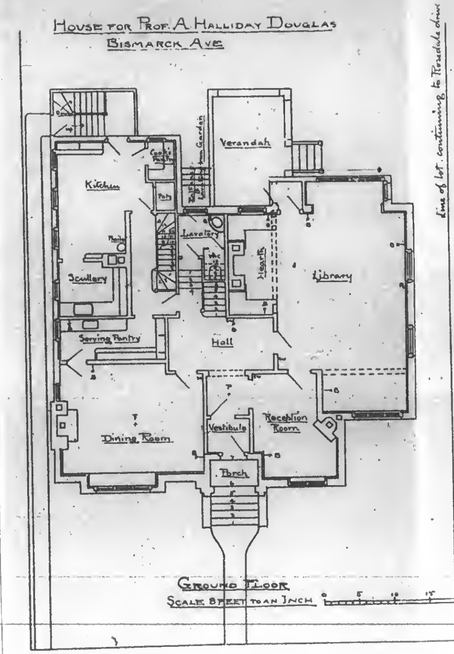

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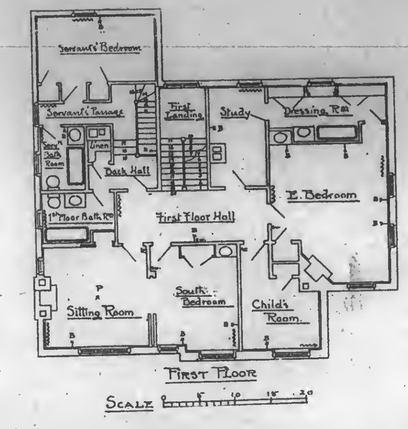

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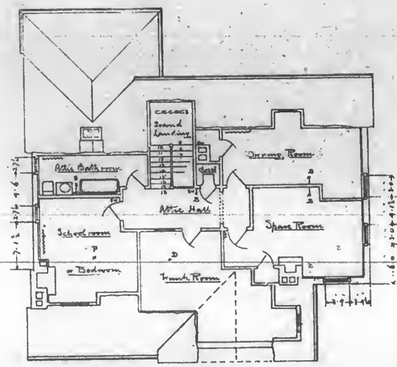

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VOL. XV.—No. 177. SEPTEMBER, 1902.

ILLUSTRATIONS ON SHEETS.

Houses on Spadina Avenue, Toronto.—Henry Simpson, Architect.
Design for Proposed Residence, Scarth Road, Toronto.—J. P. Hynes, Architect.

ILLUSTRATIONS IN TEXT.

St. Joseph's Church, Brighton, England.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Photogravure Plate—Residence for Judge Street, Walmer Road, Toronto.—Eden Smith, Architect.
Photogravure Plate—Library in Residence of Mr. B. E. Bull, St. George Street, Toronto.—Eden Smith, Architect.
Photogravure Plate—Slable for J. E. Seagram, Waterloo.—Eden Smith, Architect.
Design for a Public Library.—W. A. Langton, Architect.
Houses, corner Isabella and Huntley Streets, Toronto.—Chadwick & Beckett, Architects.

CONTENTS

Editorial	105	A Flat Iron Church	112
Our British Office	106	Building Stones in the Northwest	113
A Dominion Exhibition	107	Legal	115
By the Way	108	Structural Work in America	116
Stained Glass	108	Notes of the Toronto Exhibition	ix
Office Forms for Architects	109	The Making of Veneer	x
The Use of Colour	109-110	Personal	x
Uniformity in Specifications for Cement and Methods of Testing	111	Hollow Walls of Artificial Stone	xi
		The Gargoyles	xii

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Brick Fences.

BRICK fences which are so common a feature in England, have not been employed to any large extent in Canada, although the use of brick in conjunction with wrought iron for this purpose is noted in some recent work by Canadian architects. One difficulty which is said to attend the use of brick for this purpose in Canada, is that one side of the fence may be more subject to dampness than the other, leading to unequal expansion and contraction of the material, and ultimately to the toppling over of the structure. The use of cement instead of lime mortar in work of this character might prove a remedy.

The Preferential Tariff.

THE news comes from Berlin that the German customs authorities will in future require certificates of origin in the case of American grain. This is regarded as a retaliatory slap at Canada for having granted preferential duty on British goods coming into this country. The Dominion should now demand a certificate of origin in the case of all imports from Great Britain. This would have the effect of shutting out large quantities of German goods which now find their way into Canada as British imports and get the benefit of the preference which was intended to apply only to British manufactures. The statement is made on what appears to be good authority, that many German manufactured goods are shipped into England, where the assembling of the parts is done, after which the goods are exported to Canada and receive the benefit of the preference. At present there is nothing to prevent such a practice either by Germany or other countries. Means should be adopted to prevent the preference being accorded to any but bona fide British goods.

Province of Québec Association of Architects.

THE Council some months ago passed a resolution recommending that the Association establish a Scholarship for Students in the Architectural Department of McGill University. It is proposed that this scholarship should consist of a sum sufficient to pay the fees of the successful student during his four year's course. The action of the Council requires ratification by the Association. Two meetings of the Association were called for this purpose, but much to the regret of those who had interested themselves in the matter, the necessary number of members to form a quorum could not be got together. The matter will therefore come up for consideration at the annual meeting in January, when it is hoped the proposal will be approved. Meanwhile, by reason of the apathy of the members, the proposals, if adopted,

cannot go into effect until the opening of the winter term next year. The establishing of a scholarship of this character should awaken a deeper interest by the students in the study of Architecture, as well as in the P. Q. A. A. and the work of the Architectural Department at McGill.

A Peculiar Objection.

THE ways of the trades unions, like those of the heathen Chinee, are sometimes peculiar. News of what appears to be the very latest cause for a strike comes from Grand Rapids, Mich. The union bricklayers of that city have refused to work on a building because the foundation walls are constructed of cement and are carried up a few feet above the ground level. Members of the union state that the action was taken because of the effect the use of cement as a building material will have on their trade, the new construction not requiring the services of skilled bricklayers and stone masons, and threatening, in case of the universal adoption of the cement construction, to deprive them of a large part of their employment and thus drive them into other fields. It is a foregone conclusion that this action must fail to seriously retard the use of cement for building purposes. The adaptability of the material tor foundations and for the entire construction of certain classes of buildings, such as warehouses and factories has been so far established that its extended use in this direction in the future is assured. On the other hand, it does not seem probable that it will become popular in the construction of residences and other buildings in which a high standard of architectural effect is sought for. After all, therefore, its effect on the employment of bricklayers will probably not be serious. In any case the unions will not be permitted to dictate to owners, architects and builders what materials they shall employ in the construction of buildings.

A Uniform Size for Bricks.

A correspondent writes that the table on page 110 of the new edition of the Canadian Contractor's Hand Book, showing the number of bricks in walls of various thicknesses, will not apply to bricks manufactured in Toronto. This is no doubt true, but the table is correct for some other localities, as for example the Maritime Provinces. Our correspondent's complaint again draws attention to the fact that there is scarcely any limit to the variations in size of bricks manufactured in this country. As an illustration in point, an architect who has some work in progress in a northern town writes "I am putting up a block of stores, and because of the brick famine in this section, I am compelled to use three makes of bricks—one from Barrie, another from Stayner and the third by a local manufacturer. No two makes are alike in size. This causes a great deal of trouble in bonding." The three manufacturers from whom this architect obtained his bricks are distant from one another not more than fifty to sixty miles. It will thus be seen how sizes vary even in what might be considered the same locality. In short each manufacturer appears to be a law unto himself. In another column will be found a table similar to the one in the Hand Book, but based on the largest size brick made in the Dominion so far as we can discover. This may be of some value, but from what has been stated it will be seen that no table that could be compiled would meet the requirements. Steps should be taken by the government or by the Architectural Associations and Builders' Exchanges to compel Canadian manufacturers to adopt a standard size for bricks, and put an end to the inconvenience arising from existing conditions.

City House Exteriors.

WIDE differences of opinion exist among architects with regard to what must be considered important features of their work. A discussion took place recently among members of the profession with reference to the outside appearance of city dwellings. A certain well-known house in Chicago was cited, which in the opinion of one architect had more the appearance ot a prison than of a residence. The answer was that the interior of this house was entirely satisfactory and that the windows and doors faced upon an attractive inner court. Some of the parties to the debate contended that the exterior of a house facing the street might be of almost any character; that the owner and architect were not under obligation to make the exterior of such a building pleasing to the public; that the main requirement was to make the interior satisfy the desires of the owner. Others strongly combated these views, and held that in order that cities might be pleasing and interesting, it was necessary that attention should be given to the exterior treatment of residences as well as other buildings. Against this opinion was cited the American style of street house, which is so designed as to convey the idea that the occupants live, to a large extent, on the street. This style of house has large porches and verandahs, bow and other windows set low so that the interior is plainly visible from the street. There is something to be said in favor of both sides of this question. Perhaps the solution lies in the architect taking a middle course—that is, in making the outside of the house as attractive as the funds at the disposal of the owner and architect may permit, without in any way sacrificing the interior. It is undoubtedly proper that a dwelling should afford those who occupy it the necessary privacy, but it does not therefore follow that it should present to the observer from the street the sppearance of either a barn or a prison.

OUR BRITISH OFFICE.

Owing to increased British business, the publishers of the CANADIAN ARCHITECT AND BUILDER have established a branch office at 22 Grand St. Helen's, London, E. C. Persons interested in the building trade are requested to avail themselves of the facilities thus afforded for securing information regarding the demand in Canada for constructive materials. Our representative will be pleased to call personally in response to a request. Address the C. H. Mortimer Publishing Co., 22 Great St. Helen's, London, E. C.

In Prussia the Minister of Public Works has determined to prescribe by circular the necessary rules which are to be observed for the proper control, in manufacture, of the qualities of cement. In future every depot will be required to have a test office. The tests will not make it impossible for any but a specialist to carry them out; a knowledge of the use of the instruments and reagents will be all that is necessary. This knowledge can be acquired in either the State laboratory or in one of the cement works. Thirty pounds is to be advanced to each depot for the purpose of buying the necessary instruments, which are to be of the same pattern as those in the Charlottenburg laboratory.

A DOMINION EXHIBITION.

At the Toronto Industrial Exhibition last week the Hon. Mr. Tarte spoke of the desirability of holding a Dominion Exhibition, and of holding it at Toronto, as a good central place, already possessed of an experienced organization capable of carrying such an exhibition out. Mr. Tarte's promise to personally endeavor to help forward such an exhibition may be taken to mean that he does not ignore the question of cost. A Dominion show will require Dominion money, and its advocacy by Mr. Tarte may be considered as bringing the matter within the sphere of practical politics.

The idea ought to be taken up with energy. On the question of general expediency there is no douot that it s a great idea, having incalculable possibilities in the way of developing trade within our own borders. We do not know each other well enough. There has been a rush of development in this country of late years that requires just such an opportunity as an all-Canadian exhibition to enable the different provinces and sections of the country to become acquainted with the nature and extent of each other's productions. We are apt, both in buying and selling, to think first of other countries, because we have not yet learned to expect our own country to supply us with either the products or the market we want. By dint of successes in the World Fairs of other countries, we have learned that the fruit and dairy products of Ontario rank first class in this planet. Our fisheries have long been a main support of the Roman Catholic church, in Europe as well as in this country; and we have recently came to regard ourselves as one of the granaries of the world. Our northwest is indeed rapidly enabling us not only to sell wheat to the world, but gold, to buy it with.

Yet these are but specialties; points in which we range ourselves with other countries. There are, besides these commodities, plenty more, which ought to be as well known inside the country. It is only a few things after all that a nation can expect to supply to other countries; but it ought to expect to supply itself with all but a few things. We give each other the least possible encouragement. We say Canadian manufactures cannot afford to be first class because they have not the market to justify it. The market is here; gaping for first class articles; but importing them from the United States.

It is just such a state of affairs that a national exhibition of national productions will tend to rectify. For such a chance producers will produce their best, and we shall be able to see if we have not in our own country not only the necessaries of life—food, clothing and fuel; but also its luxuries—books, plumbing supplies and objects of beauty.

Of course such an exhibition will do us no harm with the outer world. Canada is a great country for summer visitors from other countries, and Toronto is apt to be a place of call for most of them. To say nothing of the summer conventions, which find it a convenient and pleasant meeting ground, Toronto is in the way of Americans fleeing for July and August to our north-west fishing rivers and to Muskoka; and it is near Niagara, which European visitors must see before they can face their friends at home. With a Dominion Exhibition going on, these visitors would "stop off" and "take in" the show; and more would come because there was a show to see. All of which would be good for trade, both present and prospective; and would no doubt, sooner or later, pay the cost of the exhibition. But the idea which appeals most to the imagination and suggests the greatest possibilities is the national stock-taking and interprovincial acquaintance-making that would take place; giving openings for trade, or producing at one stroke a market, for which both producer and purchaser have long been ready if they had only known of one another; a grand national courting bee to promote marriage between industry and trade in our family connexion.

To take one example which is of interest to readers of the CANADIAN ARCHITECT AND BUILDER: There is abundance of building stone in Ontario; limestones, sandstones, granites, gneisses, serpentines and marble. Specimens have been collected by the Bureau of Mines and made a striking exhibit at the Pan-American Exposition. Yet for these stones we go to Indiana, Ohio, Scotland and Italy; and for all that can be seen at present will continue to go there indefinitely. Here is one sort of product that our deserted waterways might very well carry, and there is nothing so likely to cause them to do so as a National Exhibition, well carried out.

This brings us to the aspect of the question which is more within the province of this journal than the question of the general advantage of holding such an exhibition. If done it must be done well; and in that need lies the chance of Toronto redeeming its lost opportunities in the way of both grounds and buildings for its Industrial Exhibition. It is at these grounds that the Dominion Exhibition will naturally be held. But while the Toronto Industrial Exhibition Association is no doubt the best available means of putting it on foot, the grounds of the exhibition are not only inadequate—a defect easily corrected by the juxtaposition of the extensive vacant military ground by the Stanley Barracks and the filling in which it is proposed to do on the lake shore—but, to have any adequacy at all as a mere portion of the show, the grounds will require an upsetting and reconstruction from which they will never recover; and that is what they want. It is such a chance to get things pulled down and things built that is not likely to occur again for many years; for the Park Commissioner, though stout, is temperate, and apparently healthy. Would he were a worse man, and had a better imagination! The grounds of the Industrial Exhibition, regarded as fair grounds, are just about as near nothing as they can be. An annual visitor has still, every year, to think before he can find his way to the grand stand. As for finding his way from it—there is but one way for everybody, and that in the wrong direction. Happy is the suburban Parkdaler who alone, when the fireworks are done, gets home to bed, undegraded (and unbruised) by crushing in a street car. There ought to be an eastern exit connected with either trams or trains; and the necessary accomplishment of such additional exit for a big Exhibition might be made one of Toronto's permanent gains proceeding from the Dominion show. But these, through important considerations, are quite secondary to the absolute want of effect in the present fair grounds. The plan is mere confusion. There is no leading idea, no visible arrangement, no attraction for the eye. These wandering roads with incoherent

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buildings on them make no recognition of the fact that, a Fair is after all a great out of doors assembly; that people are out of doors most of the time and want to find their pleasure in being there. By making proper effort a Dominion Exhibition might be made an occasion to change all this. Its principal court would suffice for the main portion of the permanent Toronto Fair; and matters should be so arranged that the buildings round this should be made permanent and the court designed to be sufficient both in size and beauty to make the Toronto Exhibition what it should be.

Mr. Tarte's proposal that the Dominion Exhibition should be held next year leaves too short a time to do the thing properly; on the other hand it is hard to do anything that will take two years to do, on a ground where an Exhibition is held every year. But there are preparations, drawings contracts, ironwork, etc., that would be all the better for having a year, or all that is left of it after getting under way; and the filling in of the lake front might also go on at once. It would be cruel to shorten the Street Commissioner's enjoyment of such a happy dumping ground for ashes to one brief year. Besides there is going to be a shortage of ashes this year. With one year to advance preparations as far as possible, and a season of great activity, the thing might be done for the June after next. It would take this time, also, one would think, to make sure of good exhibits.

If it is to be accomplished so soon as this there is no time to be lost, and even if it is given another year there is no occasion to delay taking the preliminary steps.

BY THE WAY.

Referring to a crusade which has been started in Dundee against the defacing of buildings by smokers striking matches against the walls, the London Builders' Record points to the necessity of using for walls which are liable to defacement from any cause, materials which are proof against disfigurement. Glazed or glass tiles or bricks will meet this requirement in many positions.

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In remodelling the Union Loan Building, Toronto, Messrs. Burke & Horwood, the architects, have adopted the American plan of designating the ground floor as the First Floor, the floor above as the Second Floor, etc., and have so numbered the rooms as that the room number shall indicate the particular floor on which it may be found. For example, on the first or ground floor the rooms number from 10 to 19, on the 2nd floor from 20 to 29, on the 3rd floor from 30 to 39, etc. The numbers of the several floors are shown in bold figures on the sides of the elevator.

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The residents of a London street in which a large building was in process of construction appealed for and were granted an injunction restraining the contractor from operating a derrick before 7 a.m., on the ground that it spoiled their slumbers. The contractor did not let the matter rest there, however, but carried the case to the Court of Appeal, which discharged the injunction. The court held that there was no vested right which secured people living in a residential street from being disturbed before 8 a.m. It was to the interest of everyone to have the work executed as quickly as possible. The contractor also submitted the plea that he was under penalty to complete the building by a given date.

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The members of the Institute of British Clayworkers hold a yearly excursion and visit in a body places of special interest where combined with pleasure information of value to the trade may be obtained. The practice is a commendable one. This year a visit was made to the clayworking districts of France. In this connection the British Clayworker remarks: "The trade in brickmaking is a long way behind England as a whole. There are comparatively few facing bricks made in France, and those chiefly in the Burgundy district, which we did not visit. The common brick trade is, generally speaking, of a very inferior stamp, but those made at Vaugirard were of a very fair quality, and the fire bricks made at Boulogne were excellent. The glazed bricks made at Ivry cannot compare with those made in England by the best firms, but they were excellent bricks, and the question arises whether the perfection and costliness of the English article is justifiable or necessary for ordinary purposes. We should be inclined to think that a product equal to that of Ivry would find an immense market at its relative price in this country. The French tile is undoubtedly a very superior product and worthy of extensive imitation. It is universal on the Continent. It is cheaper and lighter than the plain tile and more ornamental. It is cheaper and cooler than the slate. Some very good work is done in terra cotta, but it has not the pretensions of English architectural terra cotta. The use of it is undoubtedly limited by questions of cost, and it is only on very superior buildings that the architectural stoneware produced at Ivy could be introduced."

STAINED GLASS.

At a meeting of the Sheffield Society of Architects and Surveyors Mr. A. Jeffery delivered a lecture on "Stained Glass," in which he said that the first stained glass executed in England was in the time of King John. Previous to this all glass came from Italy, which even at this date boasted of eminent artists. The old masters taught us many lessons, and much could be learnt from them. We should try and embrace all the good qualities of the old men, ignore their shortcomings, and try to improve on what had been done before us. After the sixteenth century stained glass died out, and did not again revive until the nineteenth century. Mr. Jeffery went on to explain that a window should be part of a building, and should not be treated as a picture or wall decoration. If a man attempted a picture he spoiled his material as glass and made a very bad picture. The lecturer described the different methods of manufacture. He said that English glass was superior to foreign, both in material and workmanship. The most important point in a window, in his opinion, was permanency, and only the most permanent of colours should be used, at whatever cost. Speaking of domestic glass he did not think the modern style was a passing fancy, but that it had come to stay, but like all other transitions in art at the outset it seemed to have been let loose, and we appeared to be seeking after something we could not quite grasp. But the style would ultimately settle down and find its own level. He was eagerly looking forward to the time when there would not be so much commercialism in connection with artistic crafts, and hoped architects in the near future would come more into contact with the craftsmen, and by their joint ideas succeed in raising the standard of work.

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OFFICE FORMS FOR ARCHITECTS.

We have received from Mr. Walter Chesterton, architect, of Winnipeg, a copy of a form of certificate which he has used for some time past and has found very satisfactory. We take pleasure in reproducing the form herewith for the information of our subscribers to whom we trust it will be found valuable. In this connection we would be pleased to receive from architects copies of any office forms which they may have proved to be particularly adapted to their requirements, as well as particulars of office methods generally.

No.....

.....190..

Contractor.....

Contract.....

.....

Proprietor .....

AMOUNT OF CONTRACT	$	Cts.	$	Cts.
Amount Certified Previously				
" Deductions				
" Retained				
Now due			$	
EXTRAS.				
Amount of Claims				
Previous Payments				
Deductions				
Amount Retained				
Now Due				
Total Due			$	

ARCHITECT.

No.....

WINNIPEG, MAN.,.....190..

I hereby Certify that .....

is entitled to.....100 Dollars,

for.....Labor and Materials used on CONTRACT

and.....100 Dollars for EXTRAS allowed in the EXECUTION / ERECTION and completion of.....

for.....

.....

Architect.

STATEMENT.

EXTRA WORK.	$	Cts.	$	Cts.	CONTRACT.	$	Cts.	$	Cts.
Total claim					Amount of Contract				
Previous Payments					Amount previous payments				
Deductions					" deductions				
Amount Retained					" retained				
Amount now due					Amount due on contract				
Received payment.....190					" " for extras				
					Total amount now due				

THE USE OF COLOUR.

Considerable regret is felt by many of the older members of the A. A., that colour is being so little studied by the students of to-day. The primary cause is, no doubt, that there are already so many subjects which must be taken up for the examinations; but I am inclined to think that, behind this, there is also the consciousness that it is a big subject in which the way is not very clear, and in which the results, as seen in the experience of their elders, are apt to be extremely uncertain. The student sees examples of the introduction of colour, by good men too, which he cannot bring himself to think are of much advantage to the building though not without harmony in themselves, nor wanting in attractive quality as to design; and he is puzzled as to what to study, or what to admire. And the real fact is that, as a "Handmaid of Architecture," colour is neither properly studied nor even properly looked at by the majority of architects. One has but to turn to the papers read and the discussions on them to realise that the attention is all given to points of method or medium, or to questions of hagiology ar archaeology, all matters interesting in themselves, but only in a secondary degree of importance to the architect's work. It is hardly an exaggeration to say that even the harmony of colour itself is, for the architect, a study of secondary importance; for he may obtain assistance in that when it comes to the execution; but it is of the first importance for him to know and understand what colour can do for his building, and how. This means that he needs to study and understand not so much particular harmonies and contrasts of individual hues, as the general principles on which the placing of colour of different values depends, to influence the ultimate effect of the whole interior, that is to say, as influencing the architecture. This is what really concerns the architect, and it concerns him just in the same way as the sections of his mouldings or the position of his carved detail concern him—they are all matters vitally affecting the general impression which his building is to produce.

Let us then endeavor to see what should be the attitude of the architect towards colour. Firstly, he wants to be sure that his building will gain by the use of colour. It will certainly gain if the colour helps to explain and adorn it without disturbing the sense of repose, or if it, perhaps, assists in producing repose. Observe that the quality of repose has nothing to do with the "medium" to be used or the "subject" to be introduced. It has to do with simplicity of expression in all that concerns the suggestion of stability. Now colour, properly placed and of proper value, can greatly assist simplicity of expression, even amidst much elaboration; just as it can also annihilate simplicity. This is almost entirely a matter of judicious placing of the colour values; that is, so adjusting them that those structural forms which express stability, are first recognized, and that features of secondary importance are not the first to attract notice or to compete for attention. This does not imply that colour is to be lavished on the structural features—far from it. The end may be often attained by leaving them almost plain; but it means that they are to be constantly in mind, and that whatever is done with colour must be so done as not to set up an interest at variance with, or detracting from, the structural expression. This is not an empirical statement, it is a sufficiently obvious general law; but it receives extraordinarily little attention from those whom it most concerns; for in its application, it is not only less simple than it appears, but it is capable of infinite variety.

When the colour decoration of an interior has to be considered, it requires to be studied in the first instance much as a picture would be, as a whole; and, as with a picture, although some special scale of colour may be intended, it will be better in most cases to think it out, or plot it out in monochrome; for so the mind will be less embarrassed by a multitude of problems at

one time. At starting, what we have to decide is which lines or features are essential to the expression of the building, and how these can best be maintained as a connected whole. In some places they will need accentuating, in others rather blending or connecting with adjoining surfaces—for we do not want a harshly defined network or skeleton of construction exhibited—we want to recognize the bony structure, not to have it shown detached from the muscular tissue. All this and the main features of ornamental treatment can be best worked out in black and white; for by this it is more easy to see where force is required, where to be avoided; and the effect of awkward or ungraceful lines is more easily recognized. It is only when the scheme has reached the point where these general requirements have been satisfactorily adjusted, that the question of rendering it into colour need be taken up. Of course with lengthened experience, the practised colourist arrives at the result by a short and mental process.

Now the rendering into colour of any scheme of decoration naturally demands not only a knowledge of colour, that is of the effects of colours on each other and of their harmonies, but it also demands considerable experience in the use of colour for decorative purpose, where each colour has to be used point-blank, without the shadings and modulations which play so important a part in the colouring of a picture. And, besides this, experience can alone prepare even a good colourist for the extraordinary changes to which his colours are subject between the palette and the surface to be decorated. No one who has not the experience can be in the least prepared for the amazing pranks which reflected lights can play on colours; nor for the almost equally astonishing influence of the tones prevailing in the proximity of the parts under treatment. These are matters which cannot be learnt at the desk or the drawing board; and for that reason, if for no other, the execution of the scheme in situ needs the experienced hand if it is to succeed. But a much more limited experience may succeed in projecting an excellent scheme, if only guided by a true architectural sense; and when I said above that a knowledge of the harmony of colour was, for the architect, of secondary importance, what I intended to imply, and what I think will be seen is that such knowledge, however desirable, and however essential for the full working out of a colour scheme, is less necessary for the architect than the perception of the nature of the aid to be looked for from colour; and that, whilst few can have the time or the opportunity to gain such a knowledge of colour as would enable them to prepare and carry out a whole decorative scheme, most architects can, if they will, train themselves to see how and in what form such decoration can be of service to their building. Careful observation and the habit of analyzing the motives in good examples, and the value of the results obtained, will by degrees render the student much more confident as to the direction in which he must seek success in his own works.

The study of colour, if a man has any developed sense of colour, may be carried on day by day, by observation or by practice, in a dozen different ways. Sketching, whether from landscape, from flowers, or from example, is all good study if done with the mind awake to understand the lesson. In sketching, we have to grasp the fact that each colour is affected by others near it, and that its value is relative, not fixed. We have to learn that the foliage of the tree which comes into our subject cannot be represented by the hue of its individual leaves, but by the different hue produced by the many thousand lights, shadows and reflections of its many thousand leaves, qualified too by the tones of adjoining objects and by the interposed atmosphere. Similar lessons are to be learnt in sketching from flowers, in the doing of which the student will soon find that the charm of his subject and its harmonious contrasts largely depend, not upon the direct contrast of a brilliant flower with an individual leaf, both equally lit, but upon the contrast of the bright flower itself enriched by some shade, with foliage tones qualified by shadow and reflection. His sketch, if it does not catch these facts, fails of its colour lesson. When it comes to the application of such lessons to decorative colouring, as harmony, the student has to remember not what was the "local colour" of flower or leaf, but what tones of colour produced the harmonious effect, so that when he sees his sketch at home, in a diffused light, he still has some equivalent of the original charm.

For the study of the application of colour, decoratively, the great school is Italy; but before a man can profit by it he must have some amount of mental training, and have done something in the way of cultivating his powers of analysis; that is to say, he must have learnt not only to recognise what is good, but why it is good; and to be able in some degree to understand what the artist aimed at. Perhaps only by degrees will he arrive at appreciating the subleties by which the end was attained: for these, like the master touches in a picture, are only to be recognised by one who has himself made some progress. But the broad principles and general motive can be understood by anyone whose architectural instincts are true, and can bring an unprejudiced mind to study them. At the same time he has to be on his guard against confounding executive merit with decorative excellence; for it is only too true that as the former grew the latter tended to decline. In Italy, moreover, the really good work is often swamped by a vast quantity of later bad art, frequently so bad as to discourage the student from his search for the good.

There is another, collateral method of studying colour decoration, which is interesting in itself and affords valuable training too. It is the habit of regarding every interior in which one may happen to spend a little vacant time, as a possible subject for colour treatment. In the intervals of a concert, between the acts of a play, or during the delivery of some after-dinner speech, to try and think out carefully a scheme of colouring for the place in which you would otherwise be suffering ennui, is at once a diversion and profitable study. You have to be your own critic and to ask yourself "Why?" at every step; but the habit gives a useful grip of the way of looking at the subject.

The study of colour, however, once pursued, has a constant and ever new attraction which grows with the pursuit. The architect who does not heed it leaves one side of himself uncultivated, and loses one joy in life; his buildings lose a part of their possible charm, at any rate within; or sometimes, by later inconsequent or unskilled treatment, lose all.—J. D. Crace, in A. A. Notes.

CANADA PAPER CO. SMITH & GEMMELL, ARCHITECTS.

UNIFORMITY IN SPECIFICATIONS FOR CEMENT AND METHODS OF TESTING.

The attainment of a standard specification is greatly desired by all those called upon to use cement in works of construction; indeed, this matter is of such importance to the manufacturer and consumer that both are concentrating their efforts in endeavouring to accomplish this result.

Mr. Lesley has given us much interesting information in regard to the great variation at the present time in specifications for cement, these variations not only arising from differences of opinion between experts as to what constitutes good material, and from different methods of testing, but also arising in many instances from lack of knowledge or from inexperience. Some of the specifications call for high strength, others for low; some require quick and others slow setting; many require a finely ground product to be slow setting and to be low in sulphuric acid, which is difficult and often impossible to produce; others introduce chemical qualifications which, if not submitted to an expert for approval, often impose very unnecessary restrictions on the manufacturer.

The difficulties under which the manufacturer labours are therefore evident. His material must satisfy all of the specifications of his different contracts, and a single product can scarcely be controlled by subsequent treatment to meet these different requirements; also he is sometimes asked to meet impracticable conditions. The advantages of a uniform specification to a manufacturer would therefore be great. Instead of being obliged to meet irrational and sometimes impossible specifications requiring a great variety of grades of material, he would be required to produce only one, or possibly two, grades, one quick and one slow setting. His work would be greatly simplified, which would not only reduce the probability of producing inferior material, but also tend to reduce the cost of production.

The advantages of uniformity in specifications, moreover, are by no means entirely in favor of the manufacturer. The material would be ground to a certain fineness, have a definite specific gravity, and develop a strength with less range of variation when treated under definite conditions. Thus the consumer could depend upon the quality of his material better than he does now, and would consequently be able to use it more understandingly, by adopting more efficient methods of manipulation and more economical designs. He would also be able to establish the fact when failures in mortar and concrete occur from poor workmanship and improper manipulation of the materials rather than from the inferior quality of the cement, and he would apply such remedies as would secure more durable and permanent structures. The investigation of cement in any one branch of construction would have a definite bearing on all cement construction and could be utilised in every line, whereas now they excite interest only in a general way.

Again, the consumer would not only save money through economies in manipulation and design, but his material would actually cost less, due to the reduction in cost to the manufacturer, resulting from the production of a standard article. The small consumer, also, not having sufficient appliances for accurate testing, would be more sure of the character of his material. Under the present system he is liable to get all the inferior products of the mill and the shipments which have been condemned on more important work, whereas if only a standard grade of material were produced he would be more likely to secure a normal product.

Everyone connected with a laboratory for testing cement knows the great influence which details of seemingly minor importance exert upon the results. In the preceding part of this paper it has been assumed that uniformity in specifications is equivalent to uniformity in the material itself, but this evidently would not be the case unless the specifications were based upon a standard method of testing. For instance, one laboratory might obtain a certain value on a seven-day sand test and another might obtain a much greater value on exactly the same material. Therefore if the uniform specification called for a value intermediate between the two, the first laboratory would require a higher testing cement than the second, even should their requirements be identical. In order for a uniform specification, therefore, to have any practical value, it must be based on a standard method of testing.

The principal reason that tests of cement show such variations in the results obtained by different operators, is that it is one of the few materials that is not tested entirely in the form in which it is manufactured and sold. Bars of iron and steel, bricks and wood, are tested not only in the form in which they are to be used, but also in the form in which they are produced and sold. Cement, on the contrary, is made in one form, tested in a second and used in a third form.

The tests of cement may be divided into two classes: First, those which can be made with comparative accuracy, and second, those which are only relative owing to the great influence which the personal equation has upon the results.

The first class of tests are those made on the material as it is manufactured and sold, i.e. specific gravity, fineness and chemical analysis. The second class includes those tests which are made on the material after it has been subjected to certain processes and combined with other elements, and hence exists in a different form from that in which it was produced, i.e. time of setting, tensile and compressive strength and soundness

The first class of tests are capable of standardization, providing the apparatus and materials used are made and handled with precision. The second class, on the other hand, are subject not only to variations in the material itself, but also to variations in the other elements used with this material and to variations in the processes employed in combining them.

On account of the difficulty of procuring suitable apparatus for making tests and of manipulating it with exactness, variations will be found to some extent to affect all tests.

The determination of specific gravity is probably least subject to variations due to differences in method where reasonable care is exercised in its manipulation.

The test of fineness, on the other hand, is subject to variations on account of the difficulty of procuring standard sieves and of manipulating them with precision.

Chemical analyses are also subject to similar irregularities. In the tests made on pastes of cement, the inaccuracies of manipulation enter with double force, on account of the introduction of other elements and of the greater influence of the personal equation.

On account of these many possible sources of error, therefore, it is evident that every detail of manipulation and every piece of apparatus used must be prescribed exactly, thus standardizing the methods of testing if it is desired to adopt a uniform specification.

This, however, would not be the only advantage gained by the introduction of uniformity in methods. Even if there were no thought of adopting a standard specification, a standard method of testing would still be decidedly beneficial, in that it would place all results obtained on any material, in any place, on exactly the same basis. Under the present system the results of tests in one laboratory are of little practical value to another. If, however, these results all had the same basis they would have a direct bearing on, and be strictly comparable with, the results obtained elsewhere, which would vastly increase our knowledge of the behaviour of the material, and also render unnecessary a great amount of duplication of investigations.

For instance, a laboratory might make an apparently exhaustive series of tests investigating some property of cement. These tests might be repeated by a second laboratory, using different methods and probably obtaining results seemingly contradictory, thus leaving every one confused as to the indications of the tests, whereas if standard methods had been used the results would be much more likely to have been corroborative.

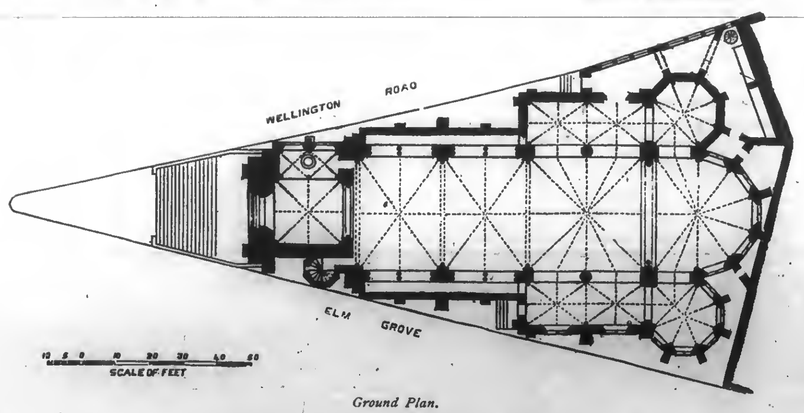
Standardization of methods, therefore, would have the great advantage of placing on a common basis all results either of routine work or of experimental investigations.

Another benefit also would be the doing away with the constant source of friction between manufacturer and consumer in regard to the results of tests. The manufacturer's laboratory may use a method giving high results, and the consumer's laboratory may yield lower values; both, however, being accurate as regards their respective method. The manufacturer, not always realising that the consumer's specifications are based on the results of his own laboratory, and not of the manufacturer's, is constantly endeavouring to show that the failure to meet the requirements is due to the consumer's methods. This is a comparatively unimportant matter, but it helps to show the many annoyances that could be obviated by standardisation.

The American Society of Civil Engineers, through the report of its committee in 1885, was the first to inaugurate a set of rules for the uniform testing of cement. While these rules served their purpose in an excellent manner for a number of years, they fail to entirely meet the requirements of to-day. This has resulted from several causes, among which may be mentioned, first, improved methods of manufacture; second, increased knowledge of testing and better acquaintance with the properties of cement; third, the demand for greater accuracy and the more rigorous requirements in specifications; fourth, the increasing importance and magnitude of the works of construction in which cement is used as the principal material.

In recognition of these facts, the Society has recently appointed a committee to report methods for the uniform tests of cement. In carrying out these instructions the committee is confronted with the difficulties attending the selection of standard methods by which uniform and comparable results may be obtained. Anyone engaged in the testing of cements must necessarily encounter the same difficulties and must realize that the basis of a standard specification is a system of testing which will give uniformity in results. This fact cannot be too strongly emphasised. It would therefore appear logical that the first efforts should be directed towards securing uniformity in methods of testing, then the foundation of a uniform specification would naturally follow.

*A paper read before the American Section of the International Association for Testing Materials by Mr. George S. Webster.



Ground Plan.

ST. JOSEPH'S CHURCH, BRIGHT N, ENGLAND.

A "FLAT-IRON" CHURCH.

To the Editor of the CANADIAN ARCHITECT AND BUILDER.

SIR,—In an editorial last month (September) you made reference to the much advertised "flat iron" building recently erected on the corner of 5th Avenue and Broadway, New York. Many people imagine this building to be the only one of any importance ever erected on a similar gore. To show this to be a mistake, I enclose you herewith the plan and perspective of St. Joseph's Church, Brighton, England, built in 1879, on a gore similar to the flat-iron" gore. It will be seen the tower and steeple stand on the narrow end of the plot, and rise to a height of some 200 feet above street grade. This illustration is taken from the Builder of March 13th, 1880.

The church at the time came in for considerable criticism, because a perspective view of either side of the building obtained at certain angles, gave to the building a narrow and stilted appearance. Taken from the other end of the church gave it an appearance of being larger than it actually was.

F. T H.

Collingwood, Ont Sept. 8, 1902.

BUILDING STONE IN THE NORTHWEST.

Until recently the impression prevailed that there existed in the Canadian Northwest but little building stone. Investigation has revealed however that extensive deposits of more or less excellent quality, are to be found between Winnipeg and Lake Winnipeg extending as far west as Stonewall and east to Whitemouth Outcroppings are noticeable at Stonewall, Stony Mountain, Little Stony Mountain, Lower Fort Garry and East Selkirk. Stone from these points was used by the Selkirk settlers very soon after their coming to the country. Lower Fort Garry gives evidence of the use of this stone by the Hudson's Bay Company; the Kildonan church, and St. Andrew's church at the rapids are later examples. The early tombstones were made of the same material.

The Stonewall quarries have been considerably developed. Those at Stony Mountain have been used very largely for building in connection with the penitentiary. The main quarry at little Stony Mountain is owned by the city of Winnipeg and from it enormous quantities of stone have been used on the streets of the city, both as curb and foundation stone and for concrete and macadamizing. From the Selkirk quarry has come most of the ornamental stone used in Winnipeg.

Mr. Garson, formerly a contracter of St. Catharines, while erecting some buildings at Rat Portage, searched this territory for a stone which would meet his requirements, and located a deposit of 60 acres about two miles from Tyndall station on the C. P. R. and 29 miles from Winnipeg. He proceeded to develop the quarry and has already taken out 75000 tones of stone from an area of an acre and a half at a depth of less than 20 feet. As to the appearance of the stone, Mr. D. A. Dowling, B. A. Sc., in his report on the geology of the district says: "It presents a peculiar mottled appearance, which adds much to its beauty as an ornamental stone. This strange mixture of brown and white is difficult to account for. In some cases it appears as if its origin might be due to seaweed remains. Often the colo re portion approaches the color of yellow ochre and seems impregnated with iron, while the intervening spaces are more or less colored. So marked is this mottled condition that stone from this section can be distinguished at once from other stone in the Lake Winnipeg district."

The death is announced of George Farquhar, a prominent contractor of Toronto.

PUBLICATIONS.

Modern Carpentry — a Practical Manual — by Fred T. Hodgson, Architect; Frederick J. Drake & Co., Chicago, publishers.

This new work, by a well known author, consists of 195 pages enclosed within cloth covers, and copiously illustrated. It treats in plainly understood language of carpenter's geometry and joiner's work, and gives many practical examples of best methods of performing various kinds of work. The book concludes with a number of useful tables and memoranda for builders.

The London Builders' Journal tells of a contractor who has carried sleight-of-hand (on a large scale) into the domain of building construction. He was recently building a dozen houses, each with a kind of underground kitchen which the local authorities required to be connected with the rooms above by a staircase. Now a dozen staircases are expensive, and it occurred to this enterprising contractor that it would be much more economical to have one only. So he bought a substantial staircase and fitted it up to the first house, got the local inspector to examine it, and obtained his certificate. The staircase was then removed to the second house, where another inspection took place, followed by another certificate, and so on through the whole twelve houses. In the last house the staircase was allowed to remain, but—verb. sap.—in the others its place was taken by a step-ladder.

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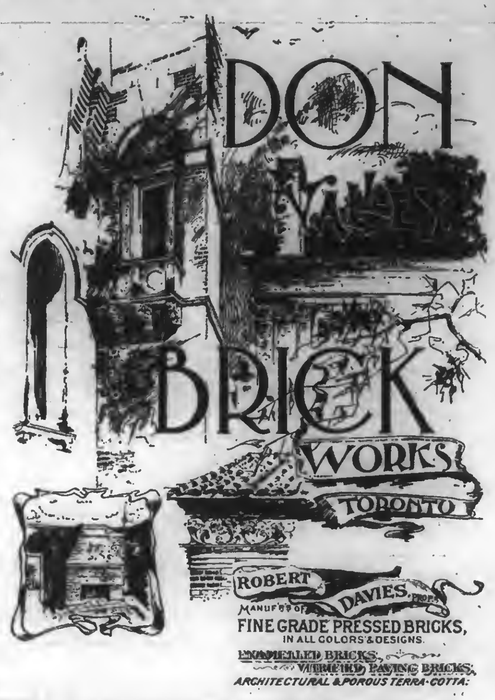
LEGAL.

The City Solicitor of Toronto has given it as his opinion that when once a building permit has been issued the civic authorities have not power to revoke it. This opinion is the outcome of a petition by the residents of a certain district in the city of Toronto to have the same included in the brick limit, and pending the change to withhold authority from the holder of a building permit for a row of rough-cast houses.

It is satisfactory to learn, says the London Engineering Times, that the (British) Court of Appeal has confirmed the judgment already given that a building owner is responsible for the payment of provisional sums for work performed by special artists or tradesmen, or for other works or fittings to the building whenever the architect shall so direct. Building owners sometimes imagine that when a tender is accepted they have no liabilities except to the contractor, and in such cases it is difficult to explain to them that there are sub-contractors who have also claims, the payment of which does not necessarily increase the total amount they had undertaken to pay. In the case in question, Hobbs v. Turner, the contract form of the Institute of British Architects was employed. Clause 28, relating to the payment of provisional sums, was therefore accepted by both parties. It was mentioned in the specification that railings of the value of £20, exclusive of carriage, fixing and profit, were to be provided for, and they were supplied by the plaintiff. A certificate certifying that plaintiff was entitled to £27 10s was sent to the defendant, the building owner, by the architect. The defendant declined to pay, repudiating his liability, and alleging that he had a claim against the builder for bad work. The Master of the Rolls interpreted clause 28 as meaning that the building owner and not the builder should be considered as the principal in regard to it. In such matters the builder was only the agent of the building owner. But his Lordship declined to decide whether under clause 28 the architect had authority to determine who was to pay, as well as to whom payment should be made. Apparently it was the intention of those who drew up the form of contract that the architect was to have the power of choice, for the sums are to be paid at such times and in such amounts as the architect shall direct, and sums so expended shall be payable by the contractor or by the employer. The only directing power is the architect and it is not suggested that it is optional on the part of the employer to pay or decline to pay. It is to be regretted that the Court was not more decisive in dealing with this part of the question, although it may hereafter be accepted that the initial liability in respect of this class of work was established.



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STRUCTURAL WORK IN AMERICA.

In the course of a very interesting series of papers on structural costs recently published in the Engineer, the practice in tall building construction in America is set forth in a manner which shows clearly how economy is attained by keeping down the labor costs, says the Engineering Magazine.

The framework is so designed that the metal shall be handled the least number of times in the making. Planing is generally conspicuous by its absence, rolled or sheared edges taking its place. Rivets are so disposed that power driving can be used to the best advantage. Joints are so arranged that they require the minimum of work on site, and their rivets can be readily put in by pneumatic tools. Hand work is seldom to be detected—everything is as the machine has left it; as many girders, stanchions, beams, etc., are duplicated as is possible; stanchions are throughout spaced regularly; girder riveting is made alike in like spans—plates being added or dropped off as required for strength, thus one girder web plate template will often answer throughout the building; cast iron bases, pockets, shoes, and connection, where used, are just as the fettler or the tumbling barrel has left them; holes are cored or punched according to material; everything, in fact, is made most evidently for work and not for show. When first seen one is tempted to think off-hand that there seems much waste of material in places and much skimping of it in others. Brackets seem large and unwieldy, whilst cleats seem small and insufficient; girder flanges appear light, and stanchions ruggedly gigantic, or vice versa, according to the object of the building. But one has only to study things out a little to realize that all this is of set purpose. We are so used at home to providing against so many chances that are never likely to happen concurrently, that our structures have taken a character of their own, and we miss these characteristics when viewing other work. If workmanship can be saved by a slight sacrifice of material, the American carefully considers it. In no land are scientific principles better understood than in his, but he is much keener after the dollar than to sacrifice it for the sake of theory, and he will unerringly fix on the cheaper way of carrying out his principle. He keeps as far way from the smith's fire as he can, and does not enlarge his scrap heap with useless croppings and clippings, and as a direct consequence gets work made very much quicker, on the whole much cheaper, and quite as good and sound and equal to what is demanded of it as though it had been made to a government specification and was finished all over.

It may be argued that this sort of thing is not compatible with good work, but there is no reason why it should not be so. In masonry structures there is no attempt made to dress the inner faces of stone which is to be backed by rubble or brickwork, and since the structural work of a modern steel building is entirely imbedded it should be made to fulfill only those demands which legitimately come upon it.

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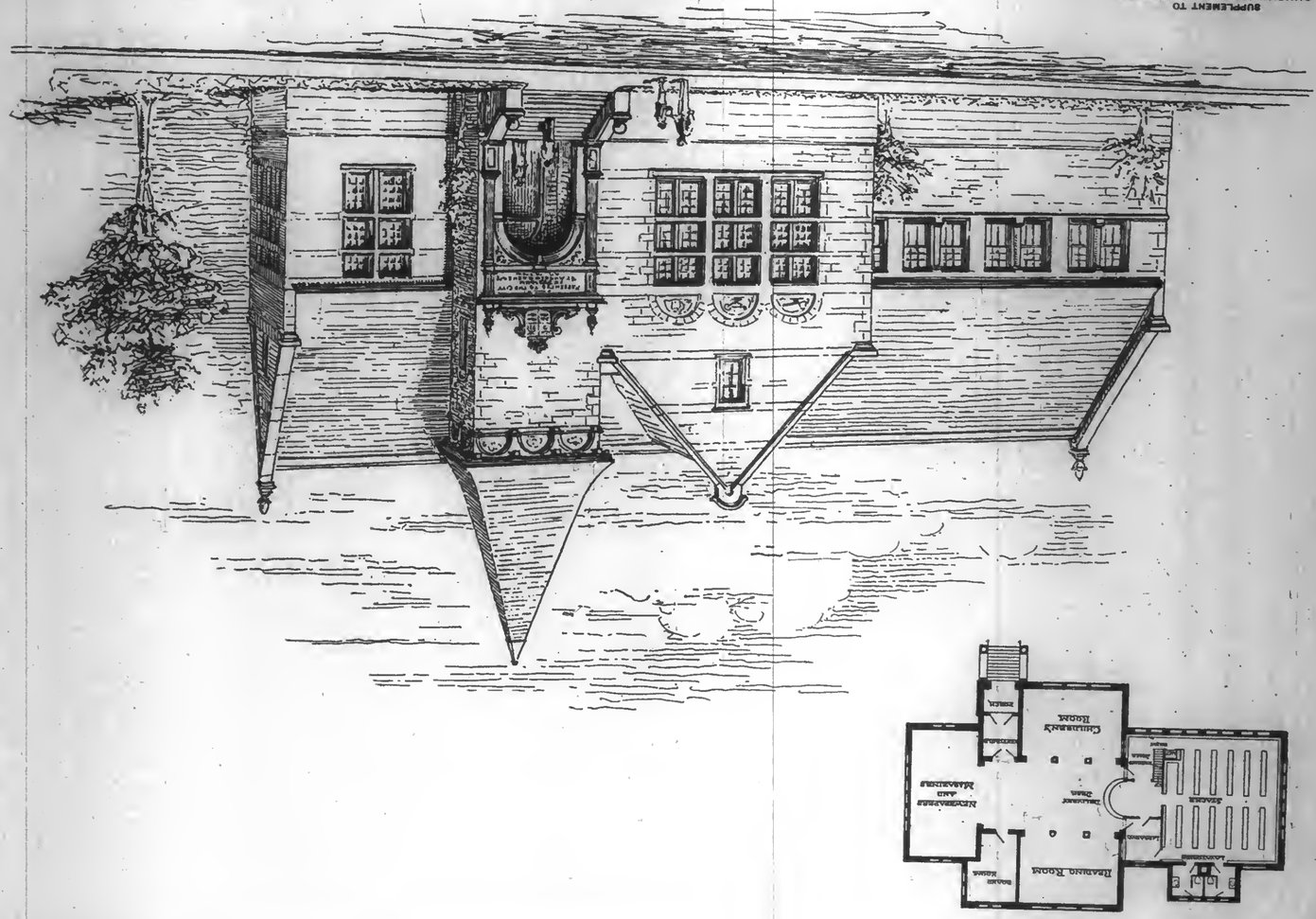

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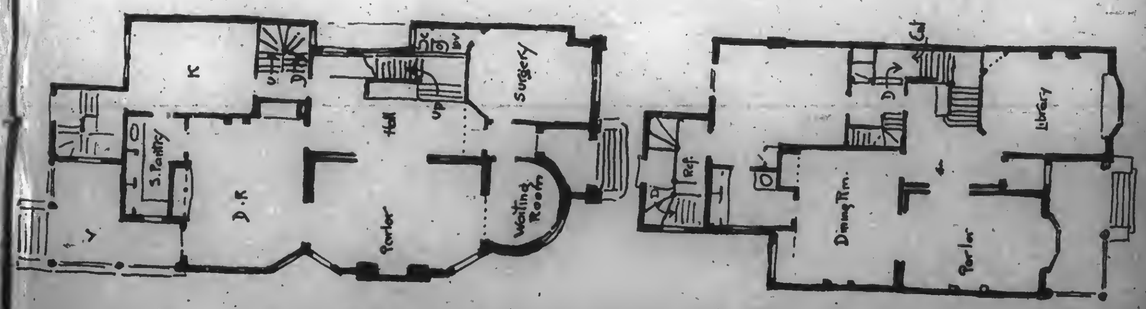

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The Canadian Architect and Builder

VOL. XV.—No. 178. OCTOBER, 1902.

ILLUSTRATIONS ON SHEETS.

Pair of Semi-detached Houses, Toronto.—Chadwick & Beckett, Architects.

ILLUSTRATIONS IN TEXT.

An Architect's Tomb.
Old Government House, Fredericton, N. B.
Officers' Square, Fredericton, N. B.
Plans for a Moderate Cost House.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Photogravure Plate—Cathedral, Fredericton, N.B.—Messrs. Butterfield, London, and Wiles, Exeter, Architects.
Photogravure Plate—Fountain in Public Gardens, Halifax, Nova Scotia.
Designs for Metal Signs—by G. S. Lemasnie.
St. Hilda's College, Toronto.—Eden Smith, Architect.

CONTENTS

Editorial	117-118	By the Way	123
A Time Saving Device for Contractors and Architects	119	The Cathedral at Fredericton, N.B.	123
Will the Coal Famine Affect Heating Methods?	120	An Architect's Tomb	124-125
Architectural Education at University Colleges, Liverpool	121	Correspondence	127
Linear Perspective	122	Building Progress in the Northwest	128
Competition for McKinley Memorial	123	The Production of Building Materials for 1901	ix
Greek Columns	123		

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" A. F. DUNLOP, R.C.A., Architect, Montreal.

Toronto Building By-laws.

IT is gratifying to learn that at last, presumably as a result of the loss of several firemen's lives by falling walls at the recent fire in a warehouse on Front street, action has been taken towards putting the building by-laws of Toronto in a more satisfactory condition. The Council have appointed Mr. A. F. Wickson, an ex-President of the Ontario Association of Architects, the City Commissioner and the Chief of the Fire Department, to revise the by-laws and recommend necessary amendments thereto. These gentlemen should and no doubt do know what changes are required to bring the by-laws up-to-date. They are now so far behind the times, that their proper amendment will involve considerable research and labor on the part of the Commission. We trust however that the subject will receive at their hands the attention which its importance demands, and above all that the Council will lose no time in adopting their recommendations and having the same printed in convenient form for the use of architects, builders and the citizens generally.

Fixing the Responsibility of Labor Unions.

THE fact is coming to be generally recognized that Labor Unions should be held responsible for losses sustained by employers by reason of interference by the Unions with their workmen, or the boycotting of their goods. A case in point is that of the Metallic Roofing Company, of Toronto. Because of a difficulty which recently arose between this Company and their employees, the Tinsmiths' Union have organized a boycott of their goods. The company have brought an action for damages in the courts against members of the Union individually, as well as against the Union collectively, with the object of finding out to what extent they can legally be held responsible. The result of this action will be watched with much interest by employers. If it should be decided that there is no legal redress to be obtained against the Unions or their members, then application will no doubt be made to Parliament to enact legislation under which labor organizations could be held responsible and liable for any damage or loss which their actions might entail. Meanwhile an organization of employers in all lines for defensive purposes has been formed.

Establishing a Building Site in Law.

A MOST remarkable case involving the legality of a building site, has just been adjudicated on at Gore Bay, Ont. Action was brought by the ratepayers of school section 2 of the Township of Allan to secure a declaration of the courts establishing the legal school site of the section upon a certain lot, known as "the old site."

The defendants were two of the school trustees sued personally and the Public School Board of the section, who maintained the legal site to be on a different lot known as the "old site." The trouble began as far back as December, 1899, when the ratepayers decided a new school should be built. The school board met and selected, subject to the approval of the ratepayers, the "new site." Then the ratepayers met again, and it is said approved of the new site, although the minutes of the meeting did not show that anything was done. The court on the strength of parole evidence affirmed that the ratepayers had approved of the "new site." This gave rise to dissention, and the dissentients appealed under the statute to the school inspector, who called another meeting of the ratepayers, at which the "old site" was chosen, and an arbitrator selected to act with the inspector. These published an award in favor of the "old site." While these proceedings were going on the Board of Trustees purchased the "new site," erected thereon a school building, and moved into it the school furniture. A motion to restrain them was refused. The courts also declared the inspector's action illegal. At the election of trustees in December, 1900, however, the advocates of the "old site" found themselves in the majority on the Board, and at once removed the school furniture back to the old building, whereupon three ratepayers applied for a mandamus to compel its return to the new building. Both parties then agreed to abide by the decision of the local judge, who declared the "new site" to be the legal site. The trustees acquiesced for the time in the view taken by the local judge, and returned the furniture to the new building, where the school was carried on until the summer of 1901. In April, 1901, however, at a duly convened meeting of trustees, a resolution was passed that the "old site" be selected as the school site for the section, and that a meeting of ratepayers be held on the 20th April to consider such selection. This meeting was held and the "old site" was adopted by a majority of seven. The court held as to this meeting that although the school site had been fixed by the action of the trustees and ratepayers in March, 1900, and a building erected on the site so fixed, it was competent for the ratepayers a year later to revert to the former site. In accordance with this view the action was dismissed and the costs declared against the plaintiffs. Nothing is said as to who must pay for the new school building, but presumably the School Board is the responsible party. In that case the new building will probably be allowed to remain idle, while the children are housed in the old one which several years ago was declared by the Board to be out of date. Such are some of the results of human perversity and legal wisdom.

Some Possible Results of the Coal Famine.

THE great struggle which is now going on between the owners and miners of the anthracite coal mines of Pennsylvania has resulted in placing the people of Canada and the United States in a very serious position. The inconvenience and discomfort which will be felt by all classes during the coming winter, should turn the attention of inventors and manufacturers to the necessity for heating apparatus in which fuel, other than coal, can economically be used. Unfortunately, central Canada, which contains the bulk of our population, has, so far as known, no coal deposits. Our coal mines are situated at the extreme ends of the Dominion—in Nova Scotia and British Columbia. The freights from these mines to central Ontario are prohibitive, so that we are obliged to depend for our supply on the United States. Wood has become too valuable a commodity in this country to be employed for fuel, except in country districts. Manufacturers of heating furnaces in Nova Scotia are adapting their apparatus to the use of soft coal, which fuel will no doubt come into general use to a much larger extent than formerly in the Maritime Provinces. In Ontario something else must be employed. The question suggests itself—why not petroleum or gas? Petroleum has long been used successfully on railway locomotives in Russia, and more recently, it is said, on railways in California, as well as on steamships, while in cities gas is already employed for cooking purposes. The designing of heating apparatus in which these kinds of fuel could be employed would seem not to be impossible, and we hope that the present situation will direct the energies of inventors to the problem. There is of course the further question of cost of fuel. Considering how large a percentage of coal is wasted, it would appear that either petroleum or gas might be supplied for the purpose at a reasonable cost. Heating by means of electricity would be an ideal method, provided the cost could be kept within reasonable limits. Thus far, however, it has not been possible for the electrical companies to supply at a reasonable price the necessary current and apparatus. Most of the central stations are operated by steam power, so that the cost is to a large extent based on the price of coal. In the United States central steam heating stations have been established in many towns. By this system steam is carried in underground conduits from central stations. This plan would seem to be better adapted for use in the business districts of cities than in residential districts. Steam, while undoubtedly the best heating agent for large buildings, is not as well adapted to house heating as hot water. A central heating plant was established at London, Ont., some twenty years ago, but proved unsuccessful and was abandoned. We observe that a Company in Montreal has announced its intention to establish a central heating station. Two or three years ago a number of companies were formed in different parts of Ontario to manufacture peat fuel, but the product has never been placed on the market, and some of the companies have abandoned the business. The difficulty in manufacturing this product is said to be found in connection with the drying of the material, after it has possed through the compressors. Natural drying is said to be necessary, in order to retain the most valuable constituents of the fuel, and this requires so much storage capacity and so long a period of time as to render the process unprofitable. We observe the announcement that a new process of drying is to be adopted by a Canadian company recently organized. This question is one of vital interest and importance in a climate like that of Canada and the United States, and we have confidence that in the near future methods of heating will be found which, if not cheaper, will be more cleanly and convenient than those which we have been accustomed to employ in the past, and it is hoped they will also render us less dependent upon one source of supply.

A TIME SAVING DEVICE FOR CONTRACTORS AND ARCHITECTS.

The primitive system of tendering for builders' work, which still obtains in this country; a system by which every man takes off the quantities for his own trade himself; has nothing that an ordinary person can see to recommend it except this one thing, that, if there is any mistake, the contractor has no one to blame but himself. The question is whether this advantage is an advantage; and, if so, whether it is an advantage sufficient to make up for the labour expended in taking off the quantities of innumerable jobs that he does not get.

It is quite possible for a contractor, who has not enough work, to take off the quantities of sixty or seventy buildings, in the course of a season. When one comes to think what this means for the principal trades, with the multiplicity of detail that has to be considered in connection with them, it becomes clear that there is in the system a great loss of labor to the community. A hundred men are occupied in doing the work which one could do, and do much better.

In the meantime while the contractors are playing at being quantity surveyors, their work is calling for them on the buildings upon which they are already engaged. Their current work is of necessity done without the care it ought to have. There is no time to really think about it. If the contractor can keep his contracts moving enough to keep the architect off his back, that is all he can do; and he cannot usually do this. There is no time for precision of work; for that love of seeing things done properly, which is bound to grow upon a workman who understands his work, and has time to think about it: and there is no doubt but that the standard of good work has been very much lowered for this reason.

It is left to the architect to oversee both the running of the work and its execution, neither of which matters are part of his function at all. An architect's function is to design buildings and see that the designs are carried out. If he, on his side, is conscientious about his work, and the circumstances demand it, of course this all comprehensive function has to be made to comprehend indefinitely. If a carpenter thinks a wire nail is as good as a tenon, the architect has to uphold the other doctrine. If the flooring has not made its appearance when flooring is due, the architect has to see that it arrives, and that it knows enough to come in out of the rain when it does arrive. But these are not properly parts of the architect's function at all. When an architect has supplied drawings for his design, and defined the quality of work required, it properly remains for him only to see that his drawings are understood. That he should have to see that the ordinary methods of good building are followed, or mingle himself with the contractor's business in order to have the work done with proper expedition, is in reality a disgraceful state of affairs; and it does not say much for "the dignity of labour" that contractors should be content with it. As long as contractors have not time to attend to their work, and are obliged to go about in fear of the architect, as naughty boys in fear of a schoolmaster; as long as the architect's attention is distracted from his designing; the standard of work is bound to be lower than it ought to be: and building, though one of the arts of peace brings anything but peace to those engaged in it.

To establish a system of tendering, which will relieve contractors of undue labor in that direction, is not likely to be a cure-all for bad work; but it will remove a condition of distracted attention which produces slighted work, from men who would tend naturally to do good work if they could give their minds to it; and it is safe doctrine to assume that these are in the majority.

The way out of the difficulty is evidently to have quantities supplied by a firm of quantity surveyors. Then the contractor need spend no more time over the

FROM THE MASON'S BILL.

Yards	Feet	In.			Rate	$	cts.
	1178		cube	Sills, scantling lengths 4 feet, 5 feet, 5 feet 9 inches, 7 feet, 7 feet 6 inches			
	811		sup	" labour only, preparatory top bed			
	560		"	" " , pitched face			
	545	6	"	" " , sunk chiselled splay			
	511	6	"	" " , groove for water bar			
			No.	184 " " , leave stool for jambs			
				Carried forward	$		

FROM THE CARPENTER'S BILL.

Yards	Feet	In.		WINDOWS	Rate	$	cts.
	1140		run	3 in. x 4 in. rebated and moulded window frame			
	344		"	2½ in. x 6 in. cedar rebated, weathered and grooved sills to last			
	1190		sup	2½ in. moulded rebated fixed sashes, and prepared for plate glass with shifting mouldings, cups and screws			
	344		run	Extra on moulded and throated transom to same 2½ in. x 3 in.			
	344		"	1½ in. x 6 in. facia, moulded one edge to window frames, scribed to arches			
	1055		"	1½ in. x 2 in. facia, moulded one edge to inside reveals, scribed to walls			
	344		"	1½ in. x 4 in. facia, moulded two edges to sills			
	344		"	Bed sills in red lead			
	344		"	⅛ in. x 1 in. metal water bar and bedding same			
					$		

drawings than would be necessary in order to understand the general character of the work and examine particular points.

It would pay the contractors, in view of the time saved to them, to purchase their quantities; but this is sometimes done by adding a percentage to the contract price.

The principal objection to the system, that is likely to be raised, is the possibility of inaccuracy on the part of the quantity surveyors. A builder thinks he can trust himself better than anyone else. That is true, no doubt, under ordinary circumstances. But we are talking now of scientific quantity surveying. A specialist is sure to leave far behind the individual efforts of contractors with their hasty methods of arriving at an estimate. Accuracy and only accuracy is what he is there for. He lives by accuracy, and is likely to attain to it with more certainty than anyone else, as his whole attention will be given to method in attaining to it.

A quantity surveyor's bill of quantities will read something like the accompanying example, taken from the bills of the new Parliament Buildings at Victoria, B.C.

There would be no occasion with bills of this kind for the wide variations that are sometimes seen in tenders, even for small amounts. Their use would probably be more profitable on the whole and certainly more straightforward for all concerned. There would be more certainty and less friction. Even if it cost the builders some trouble at first, to make such new analysis of cost as might be required to estimate in this detailed manner, it would save trouble in the end.

It would be a good thing if the Victoria government's plan, of publishing a volume of quantities, could be repeated in Ontario or Quebec, for the next important building that is erected, so that the system might have a trial.

WILL THE COAL FAMINE AFFECT HEATING METHODS?

In answer to this question addressed to a number of the leading Canadian manufacturers of heating appliances, the following opinions have been received:

BROCKVILLE, ONT., Oct. 8, 1902.

Gentlemen,—Replying to yours of the 6th inst., we beg to say that in our opinion the present coal famine being a temporary difficulty only, is not likely to have a permanent effect on the designing of heating apparatus in the future. There is no doubt that apparatus in which other fuel can be economically used can be produced and in fact have been produced already. There are at the present time in operation successful heaters using both gas and petroleum but the great bulk of the work is still done by the better known fuels of coal and wood, and we think the future will be as the past in this respect seeing that there is still a bountiful supply of both classes of fuel.

Yours truly,

THE JAMES SMART MFG. CO.

GUELPH, Oct. 8th, 1902.

DEAR SIRS,—Answering your kind letter of the 7th inst. I would state that I do not think that it will be possible to invent a heating apparatus that will work satisfactorily with petroleum or gas. These materials are too expensive and the fitting up of the burners so as to work satisfacterily has been found to be very expensive. I have been in the business along while and have followed up every invention and suggestion that has been made and have come to the conclusion that a furnace using coal is the most economical in every way. Boilers have to be so arranged in their construction that it is necessary to have direct contact with the flame to secure the best results, and with gas or other fuel to do this the distribution of burners would be too great and consequently very expensive.

Yours very truly,

JNO. M. TAYLOR,
President Taylor-Forbes Co. and A. R. Woodyatt & Co.

TORONTO, October 13th, 1902.

Gentlemen,—Replying to yours of October 6th, we would say that we regard the present coal strike as of such a temporary character as not to affect in any large way the styles of construction prevailing in centers close to the anthracite regions. Anthracite coal is admitted to be so much better than any other fuel that in our judgment it will be used very largely notwithstanding the present unpleasantness.

The difference between ordinary furnaces for hard and soft coal is not very great, the chief difference being in size. The soft coal furnace requires to be at least one size larger for the given amount of work.

The burning of petroleum in furnaces can be very successful apart from the noise, which we think will be against it as applied to dwelling house, hospitals, schools, offices, etc., where it would be objectionable. In some New England kitchens, petroleum has been in use successfully for a number of years, but even in a stove it is noisy and objectionable for that reasen.

Yours very truly,

EDWARD GURNEY.

LONDON, ONT., Oct. 7th, 1902.

In reply to your communication of the 6th, the present shortage of coal we conclude to be only of a temporary nature, and will only temperarily affect the process of heating as now conducted. There is an evolution going on in heating as well as in other lines, which will be regulated by the value of the fuel and the manufacturers will conform themselves accordingly. Up to the present there has been no more economical way of heating than by using anthracite coal, subsequently however the developments in the production of peat may be perfected to such an extent that it will make this fuel cheaper, and it is certainly cleaner; developments in that respect however have not been as rapid as might have been expected, but the present shortage of anthracite coal may have the effect of urging producers in this line to place this article on the market earlier than they otherwise would do. The supply of oil for fuel is so limited and of so uncertain a nature that unless new fields are developed, no improvements in this line are likely to be forthcoming.

We are at present manufacturing furnaces that will burn bituminous coal and coke equally well; the chief prejudice against bituminous coal being that it is not so clean to handle as anthracite.

THE MCCLARY MFG. CO.

MONTREAL, October 8th, 1902.

Dear Sirs:—In reply to your enquiry of the 6th inst., it is our opinion that there is no prospect at the present time of any other fuel or method of heating to supersede the use of Anthracite Coal for individual plants, private houses, etc.

The most economical method of heating is by hot water and anthracite coal can be more easily controlled and requires less care than any other fuel.

Most hot water boilers, especially large sizes, can burn soft coal to very good advantage, but more care has to be taken in firing, and more attention paid to keeping flues clean. Probably for large cities, central plant and heating by steam will be found more economical and more satisfactory to tenants.

It is possible also that non-illuminating gas can be made cheap enough to use in private houses for heating and cooking, but at the present time this does not seem practicable.

Reference is frequently made to the immense deposits of peat which are to be found all over Canada, but so far no process has been invented to expel the water from it, and fit same to burn, at a price that will compete with other fuels.

With regard to the use of petroleum, the supply of this is so limited and in so few hands that should there be any further extensive consumption of it, the price would be likely to rise in proportion. Therefore, for many years to come we must depend mainly upon anthracite coal for house heating, and no doubt when the present trouble is ever, it will be sufficiently low in price to be within the reach of all.

Yours very truly,

H. R. IVES & Co.

ARCHITECTURAL EDUCATION AT UNIVERSITY COLLEGE, LIVERPOOL.

There are two courses open to students:—(a) The three years' course leading to the degree of B.A., with Honours in Architecture. (b) The two years' course, at the end of which the college certificate is granted to successful students. These courses are arranged for students to take before entering an architect's office. They are not intended to supersede pupilage, but to be preparatory to it. The two years' course has been in existence for eight years; the degree scheme was only started last season. (University College, Liverpool, is the only college in England in which students can study for such a degree, although such courses exist in all the principal universities in America).

The leading architects of Liverpool have signified their hearty approval of the schemes, and have agreed to shorten the term of pupilage and reduce the ordinary premium for students who have been awarded the college certificate or have taken their degree. The two courses are framed to prevent the waste of time which invariably results when a student enters an office without any previous knowledge of drawing, building construction, and the elements of architectural design. Students entering in October will have the exceptional advantage of being able to follow, from commencement to finish, the erection of the new laboratories for physics and topical medicine which are being built on college ground from designs by Messrs. Willink & Thicknesse and Professor Simpson. Candidates for the B.A. degree are required to pass:—(a) The preliminary examination of the university in five subjects: (1) English language and English history; (2) mathematics; (3) Latin; (4) elementary mechanics; (5) one of the following—Greek, German, French. (b) The intermediate examination for the ordinary B. A. degree is in the following subjects: (1) one of the following—Greek, Latin, French, German, Italian; (2) one of the following—ancient history, modern history, English literature; (3) one of the following—physics, pure mathematics, applied mathematics. Candidates are required to present certificates of having attended: (a) the approved classes for the subjects presented in the Intermediate examination; (b) courses of instruction in architecture and allied subjects averaging not less than five hours a week in the first year and fifteen hours a week in the second and third years. Such courses shall include all the subjects presented for examination. An attendance of not less than fifty hours in the department of engineering is required from all candidates.

The subjects of examination are:—(a) History of ancient and mediæval architecture; (b) history of modern architecture; (c) construction and planning of buildings, including sanitation; graphic statics; (d) architectural drawing. And any two of the following:—(e) Freehand drawing; (f) modelling; (g) decorative design; (h) applied mechanics; (i) art and theory of painting; (j) art and theory of sculpture. Students are strongly advised not to commence the three years' course until they have passed the Preliminary examination. Although it is possible for a student to be privately coached for the subjects of this examination during his first year, passing his Intermediate at the end of the second, such a course is not advisable, nor is it recommended.

The two years' course includes freehand and architectural drawing, construction and building materials, the history of ancient, mediæval and Renaissance architecture, perspective and sciography, graphic statics, engineering, &c.

Students who receive a first class certificate at the end of the course are specially exempted from the Intermediate examination of the Royal Institute of British Architects. This is the first college or institution in England to whom this privilege has been accorded.

OLD GOVERNMENT HOUSE, FREDERICTON, N. B.

LINEAR PERSPECTIVE.

At a recent meeting of the Association Section of the Edinburgh Architectural Association Mr. Robert F. Sherar, gave an interesting lecture on linear perspective illustrated by photography. After briefly tracing the history of the science from the conventional representations of the ancient Egyptians to the finished realism of the Middle Ages, he said that the researches in the science as such had been practically exhausted by Dr. Brook Taylor and successive writers in the eighteenth century; however, it was always possible to improve on the methods of stating facts and of teaching. The lecturer condemned the confusion of ideas expressed by the somewhat ambiguous term "picture-plane," and then discussed a few questions arising perennially from this confusion. Among these questions was that this he laid down the rule that the perspective appearance depended on the position of the spectator, and on this only; and that the perspective image depended on the surface on which it was delineated, whether it was a picture-plane vertical or otherwise, or a picture curved as a panorama, &c.

In dealing with the distance a spectator should be from the the object in order to produce an agreeable result, he showed three very interesting photographs of the east end of Prince Street with the Calton Hill in the distance, and said he had often heard it remarked that photography did not give correct perspective of distant hills, &c., as it always rendered them too small. The first photograph above referred to showed the Calton Hill about a quarter of the height of the buildings, the second showed it the same height, and the third showed

OFFICERS' SQUARE, FREDERICTON, N. B., SHOWING SOME OF THE MAGNIFICENT ELMS WHICH ADORN THE STREETS.

of vertical parallel lines converging towards a vanishing point as they receded from a spectator. Having proceeded so far in a critical manner, he then described the different uses and applications of the science as an aid to the architect or painter, and with the aid of photographs taken for the purpose he very lucidly described the elementary conditions on which the science depended and was distinguished between the perspective appearance of objects as seen and the perspective image as drawn on paper. He showed two photographs of the same building taken from the same spot which were quite different in the perspective lines, and explained that they were both equally correct records of the perspective appearance as we saw it, but records only. To prove this he then showed a photograph of the first of these two pictures taken with the camera placed in front of it, so that its image fell on the left-hand side of the photographic plate instead of the right-hand side, and the result was the same as the second picture. From it twice the height. This, he said, all depended on the distance the spectator or photographer was from the object to be represented, The choice of the distance was one of the most important preliminaries of picture-making, whether by photography or other means. He agreed with all the later writers on perspective that no rule could be laid down except in a general way in order to guide the artist, the conditions varying so much in each individual case. He laid great stress, however, on the fact that these conditions should be thoroughly understood, and said they were the very things that were not clearly defined in modern books on perspective.

It is announced that Mr. Louis Hebert, the Canadian sculptor, will soon return to Montreal to reside permanently.

Mr. S. G. Curry, architect, who at the last municipal elections was elected a member of the Toronto City Council, is doing excellent service. As an illustration may be cited his business-like resolution for an appropriation of $50,000 by the Council for the purchase of fuel to be so'd at cost to the citizens.

COMPETITION FOR McKINLEY MEMORIAL.

Charles J. Cohen, Secretary of Committee, 320 South Broad Street, Philadelphia, invites competitive designs until March 2nd, 1903, for a memorial to the late President McKinley. The memorial is to cost $30,000 and is to include a portrait statue with suitable accessory architectural features. Five premiums of $500 each are offered. The author of the successful design will be given the execution of the work, if in the Judgment of the Committee he be competent. The designs are to be shown by models to a scale of one and one-half inches to the foot. The jury of award is composed of Wilson Eyre, jun., Theophilus P. Chandler, Edward H. Coates, Charles E. Dana, J. Q. A. Ward, Paul Bartlett and Frank Miles Day.

BY THE WAY.

The rumor that an American Building Trust is to be formed with a capital of $66,000,000, to undertake the reconstruction of old London, has inspired the following from Punch:—

Say, are you sure that your Combine
(Or is it Combine?) will be grounded
In all the classes of design
With which we love to be surrounded?
Can you, for instance, emulate
Our Ludgate Bridge's gorgeous gilding,
Erect the Fleet Street Griffin's mate,
Or beat the Admiralty building?

Can you prepare us plans to rank
With British Art's supreme creations?
Could you have built the Birkbeck Bank,
Or Paddington and King's Cross Stations?
Will you, when decorating walls
(Like some with whom we're well acquainted),
Declare the frescoes in St. Paul's
Are not so bad as they are painted?

If so, we greet you—oh, but stay,
It's only right for us to mention
That others in the building way
Are giving us their best attention;
And so we fear you cannot come,
Unless the Trust that you announce 'll
Put by a fairly handsome sum
To pension off the County Council.

× × ×

The City Hall tower, which is the most prominent architectural feature of Toronto, has narrowly escaped destruction by lightning. An electric discharge struck the apex, destroying the terra cotta finial and tearing off a considerable quantity of the tiling. Mr. E. J. Lennox, the architect of the building is reported as having said that he does not approve of placing a lightning rod on the tower. The most direct way to ground would be down the face of the tower which would be a disfigurement. If carried to ground over the roof of the building the rod might prove a menace to the whole structure. An attempt to protect the building would probably require the placing of conductors at numerous points. There is an old adage, to the effect, that "lightning never strikes twice in the same place". If true, the City Hall may be now considered safe for the future. The subject of the protection of buildings from lightning is one on which there appears to be great lack of exact information. It would be interesting to know with certainty whether a tall building, or projecting features such as towers and spires, are more liable to lightning attack than dwellings and other buildings of ordinary height. The fact that the recently destroyed Campanile at Venice was on numerous occasions damaged by lightning is evidence in favor of the theory that height adds to the danger. It will be remembered that soon after its erection the top of the Washington Monument was damaged by lightning, whereupon it was surrounded by a number of lightning conductors and has since escaped attack. Whether or not its immunity is due to the protecting device is of course an open question. On the other hand the results of ordinary observation would seem to prove that height has nothing to do with the matter as apparently low structures are as frequently struck as high ones. It is no doubt true that a building may be protected by means of lightning conductors, if they are sufficient in number and properly constructed to carry off the discharge, but if not, they are but an additional source of danger.

THE CATHEDRAL AT FREDERICTON N.B.

This building, an illustration of which is given in the present number, is a conspicuous feature of the capital of New Brunswick. It occupies a trangular site of considerable size in the centre of the city, and is surrounded by some of the magnificent elms which adorn the streets.

The structure is entirely of stone with the exception of the spire, which is of wood, covered with metal. The architects were Messrs. Butterfield, of London and Wiles, of Exeter. The dimensions are length, 159 feet, breath across transepts, 70 feet, height of roof 62 feet, height of spire, 178 feet. In the tower are hung a chime of eight bells, weighing 2800 pounds, cast by Warner, of London.

The windows are of stained glass, chiefly by Wailes, of Newcastle-on-Tyne. Those in the north and south aisles, recently placed, are by Clayton & Ball. The pews are of butternut and the pulpit of oak. The many handsome gifts to the Cathedral include an elaborately carved stone font, a brass lectern, carpet of needlework, altar cloth, alms dishes, communion plate, and a Bible presented by King Edward on the occasion of his visit when Prince of Wales.

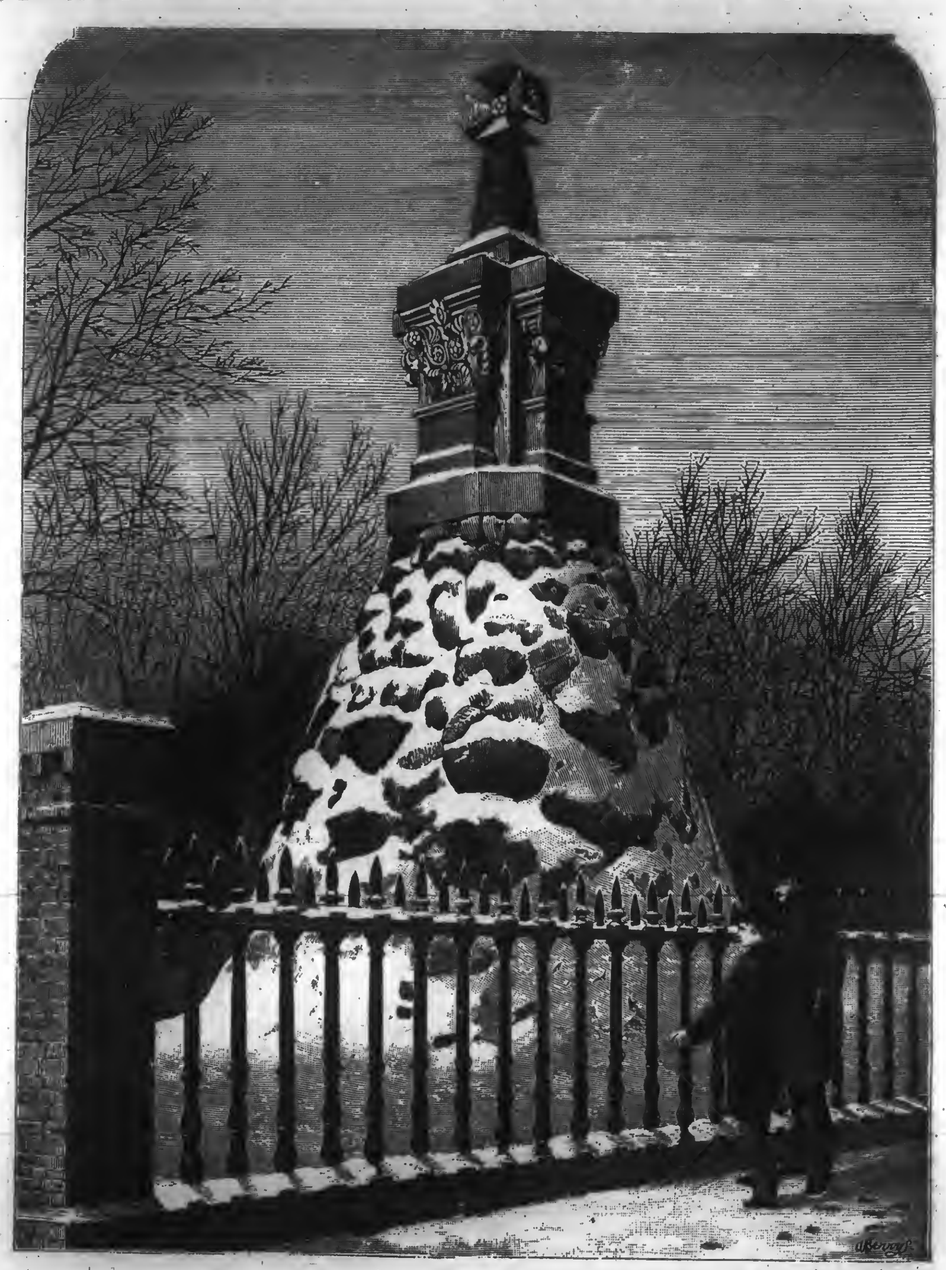
The Cathedral was begun in 1845 and completed in 1853, the founder being Bishop Medley, first Bishop of New Brunswick whose marble cenotaph occupies a place in the transept.

GREEK COLUMNS.

So far from employing pedestals to columns, which some have considered as forming as essential a part of an order as the entablature, the Greeks placed their columns immediately on the floor or uppermost step, the whole temple being generally raised on a low platform, to which the ascent was usually by three deep steps or gradini, serving as a base to the edifice; the depth of the steps was not accommodated to the human stature, but regulated so as to accord with the dimensions of the column. It is therefore conjectured that either a sloping platform of wood or lesser steps of the same material were employed as the real ascent to the temple. The Greeks invariably placed their columns singly, never in pairs, as has frequently been done by modern architects, and which, if not utterly indefensible, ought never to be resorted to unless required by positive necessity; for instance, where wider intercolumns than the scale of the order will properly admit are required; in which case, by affording additional support to the entablature, coupled columns not only excuse the width of the intervals, but take away the air of poverty that would result from single columns placed at the same distance from each other. Coupled columns are most of all offensive when forming a prostyle colonnade, especially if it be one with a pediment, since that disposition approximates so closely to that of the front of an ancient temple as to render any incongruity the more striking.

AN ARCHITECT'S TOMB.

The accompanying engraving represents the tomb of the late John G. Howard, architect, of Toronto, and his wife. It is situated in High Park (formerly Howard Park) in the western extremity of the city. This magnificent natural park of 160 acres was given by Mr. Howard to the city and will ever remain a memorial of his liberality and public spirit.



The late Mr. Howard was born in England, July 27th, 1803, and served as articled clerk for three years with Messrs. Ford and Paterson, architects and civil engineers, London. On Sept. 14th, 1832, he arrived in Toronto. In February, 1833, he won in competition the appointment of Drawing Master of Upper Canada, and held the position for 23 years.

Between 1834 and 1844 he was awarded premiums for plans submitted in competition for laying out the market block, Toronto, for gaols and court houses at Toronto, and London, Ont., for market and Queen's College, Kingston, Ont., and for Provincial Lunatic Asylum, Toronto. The latter building was erected under his superintendence in 1856.

For a number of years Mr. Howard occupied the position of City Surveyor. He was also a member of the Committee of Management of the first Artists' Society formed in Toronto, in 1834.

The following description of his tomb is reproduced from the London Builder of October 16th, 1880 :— The cairn is constructed with granite boulders. Mrs. Howard was a Scotch lady, which accounts for the cairn. Mr. Howard himself "is a Masonic Knight Templar.—therefore the double pedestal, terminating with the Maltese cross." The consecrated ground on which it stands is inclosed with some of the old iron railing which surrounded St. Paul's Cathedral, London, England, for 160 years. The cost of erecting the tomb, including vault and iron railing, amounted to $3,120. The granite boulders are all bedded in Portland cement against a brick shaft in the centre, which supports the marble pedestal. This weighs over 10 tons, and came from the Rutland Quarries, Vermont, U. S. Engraved on a brass plate, and fixed round one of the gateposts of the old iron railing, is the following inscription :—"Sacred to the memory of John George Howard and Jemima Frances, his wife. John George, born 27th July, 1803 ; Jemima Frances, born 18th August, 1802, died 1st September, 1877. Aged 75 years." On a brass plate fixed round the other iron gate post :—

"St. Paul's Cathedral for 160 years I did inclose.
Oh ! stranger, look with reverence.
Man ! man ! unstable man !
It was thou who caused the severance.
J. G. H.
Nov. 18th. 1875."

The vicissitudes of the railing are curious. After its removal from St. Paul's it was purchased by Mr. Robert Mountcastle, Waverlyplace, St. John's-wood, London, of Mr. J. B. Hogarth, iron merchant, London, and shipped by him in good condition, on board the steamship Delta, for Toronto, on the 14th of October, 1874. The Delta went on shore about five miles below Cape Chat Light, on the 8th of November. A portion of the railing was recovered from the wreck, and sent to Montreal by the salvage men in the spring of 1875, in a very mutilated state, but was brought from Montreal by Mr. Howard, 17th of August, in that year, and arrived in Toronto on the 21st of the same month. It was repaired by Messrs. William Hamilton & Son, at the St. Lawrence Foundry, Toronto, and finally fixed on the stone curb where it now stands, on the 18th of November, 1875.

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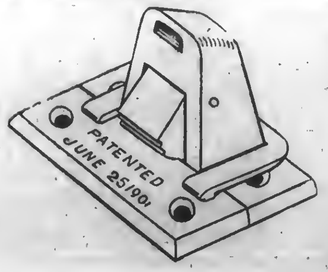

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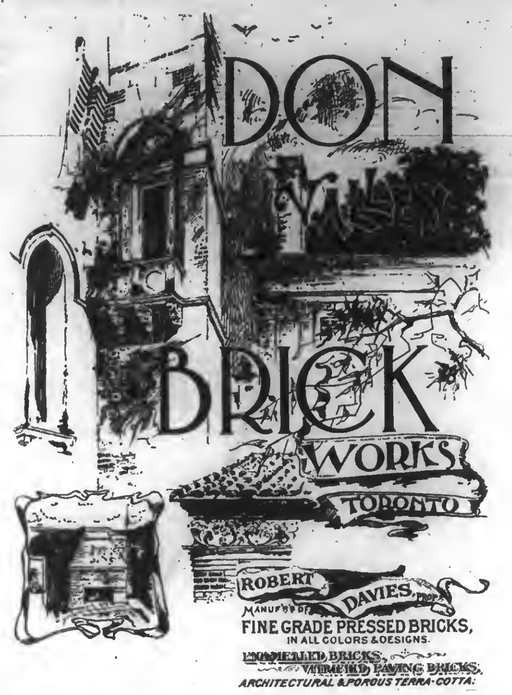
A LEGAL POINT.

To the Editor of THE ARCHITECT AND BUILDER:

A. J. B., Woodstock, Ont., writes: Last spring I gave the contract to build a house, the contractor for the carpentry work signing an agreement to do the work according to plans and specifications, he finding all materials except hardware. The job is now nearly completed, but the carpenter refuses to put in the cistern which is clearly shown on the plans and marked "cistern," but is not mentioned in the specifications except in the excavations. Can I compel him to put in the cistern? If so can I order one put in and stop payment from contract on his refusing again to put it in? By answering this you will greatly oblige.

ANSWER: It is a difficult question that is asked, with the slender data given; the writer does not say whether the house is of brick, stone or wood. If of brick or stone, the cistern, which we understand is in the ground, and either stoned or bricked up, then it is clearly the mason's duty to make the cistern. If the building is of wood, then there is a doubt that can only be cleared up by a close reading of specifications and agreement. If the carpenter agreed to do all work mentioned or shown on plans and specifications, then he must make the cistern. One thing is certain, the owner cannot order the cistern to be made by a third party and deduct cost from contractor. If, however, there is a doubt, the owner may refuse to pay up the contractor until the work is finished, which will throw the onnus of entering an action on the contractor. Another and a better way, would be to have the architect settle the matter, if owner and contractor will agree to this method.

The London Builders' Merchant reproduces from the June number of this journal the illustration of interior of St. Annes des Plaines Church, Que. Of the CANADIAN ARCHITECT AND BUILDER, our British contemporary is kind enough to say:—"The journal is in every way of the highest class, beautifully printed on good hot-pressed paper, while the reading matter is well written by experts in the various subjects. The illustrations are also good, and include some excellent photogravures on separate sheets, in addition to photo-blocks in the text. The illustration which we give will show to our exporting readers that as the most artistic work is expected in Canada, so similar materials are necessarily in demand."



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Contributions of value to the persons to whose interest this journal is publisher are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

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At the County Court, Westminster, on December 17, a plaintiff referred to a debtor as a man "with twenty trades, your honour," and produced his billhead to prove it. His Honour, looking at the billhead, said: "Is this what you mean—builder, decorator, paperhanger, gasfitter,' and so on?" "Yes, your Honour," replied the plaintiff. "Well, that's only one trade," said the judge. "I thought you meant he was a Jack-of-all-trades."—Plumbers' Review.

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BUILDING PROGRESS IN THE NORTHWEST.

WINNIPEG, Oct. 6th, 1902.

To the Editor of the CANADIAN ARCHITECT & BUILDER.

SIR,—With your permission I will run briefly over the building operations both Architectural and Engineering that have come under my notice since I arrived in the City some six months ago.

In Architecture little can be said from an aesthetic point of view, as the artistic side, owing to the conditions that govern all new cities, is still inchoate, and criticism in this direction must be touched upon very judiciously. Constructionally, work is good as is exhibited in the warehouses, etc., that have been built during the past two or three years. Previous to this time the importance of good foundations was overlooked and there are very few buildings that can boast of no cracks. The settlement in most of this work is caused by a substratum of very spongy-clay—something of the nature of a quicksand—about 6" thick and found at a depth of anywhere between ten and fifteen feet below the surface. Up to quite recently the practice has been, generally speaking, to disregard this altogether. Below this stratum a good hard clay is obtained which extends down to any necessary depth.

Apropos of clay, I think I might say a word about it, regarding the local brick. Whether it is the quality of the clay or the fault of the burning I do not know, but the "kiln run" that is generally used is a very inferior brick. Unless extreme measures are taken and a great percentage of what is delivered, rejected, very poor work is obtained. Also, as all local brick is of a yellowish gray color, a very hard, cold looking building is the result, and no soft effects can be secured, which are so helpful to many designs, especially in domestic work, when the red brick is used. A red brick is manufactured at Lac du Bonnett and Rat Portage, but the former is extremely soft and useless for good work, while the latter is just a trifle better. In stone, the same remarks regarding the cold hard effect of the brick may be applied to the local material (Tyndal). It is a hard grey limestone with iron colored streaks occasionally showing. It is a splendid stone to use where construction is the primary object, but not satisfactory for carving or fine or monumental work. It is being used extensively this year and the stone from some quarries shows considerable improvement on what has been used previously.

The season opened up so late this year that few buildings are in such an advanced stage as to allow of criticism touching design. The most important block, and the only one that can be said to be anyway in course of completion is the Merchants' Bank office building, (A. T. Taylor, F.R.I.B.A., Architect, Montreal.) This will be ready for occupancy persumably, about the end of the month, although the Bank are in possession now. This is a seven storey building and stands out very prominently as a modern office building and might almost be termed a "sky scraper" if comparison with surrounding work was to be considered. It is built of red pressed (Milton) brick and Bedford stone, the effect of which is at once bright and harmonious and the workmanship throughout is of the first order. A colonnade is formed above the height of the two top floors, with engaged columns supporting a copper entablature. The total depth of this is I think a little too great for the tout ensemble, but otherwise the exterior is generally pleasing. I enclose a photograph by which you may notice the points I have mentioned. The plan, generally speaking, is that of a good office building with two elevators. The ground floor is occupied, principally, by the Bank. In the Banking room proper an elaborately ribbed elliptical ceiling is used, which is very affective, but it is perhaps just a trifle overcrowded. The finish of the wood work in the fittings is excellent and challenges the work of any outside firm.

Of the other work in progress the Strathcona Apartment Block (Geo. Brown, Architect) in perhaps the largest. It has a foundation to about ten feet above the ground level of Tyndal stone and over this grey brick. This building is on the site of a foundation that was laid for an Hotel some twenty years ago, but the work owing to the boom and other reasons never advanced above the level of the ground, and it remained there till this spring. This building will be ready for the roof very shortly.

The Canada Life Assurance Company are having extensive alterations made to their premises, and in fact, as the work proceeds, it is hard to understand why any of the old building was left standing at all. The only portion remaining intact is the wall on Main street and Portage avenue, from the level of the first floor joists to the top of the second floor windows. The whole of the ground floor wall is to be taken out. Two stories are added to the old work, and with an extra thirty feet to the south a large five storey building will be ready for occupancy about the 1st January.

St. Stephen's Church, Portage Ave., which is being entirely built of Tyndal stone is well under way, also St. Mary's Academy which covers a large area, and when completed may be considered a great addition to the educational buildings of the city. The number of small houses in course of construction in the suburbs is astonishing, but the better class of residences is as yet very much in the minority.

Regarding engineering work, I think that very little is being

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SEMI-DETACHED HOUSES, TORONTO.
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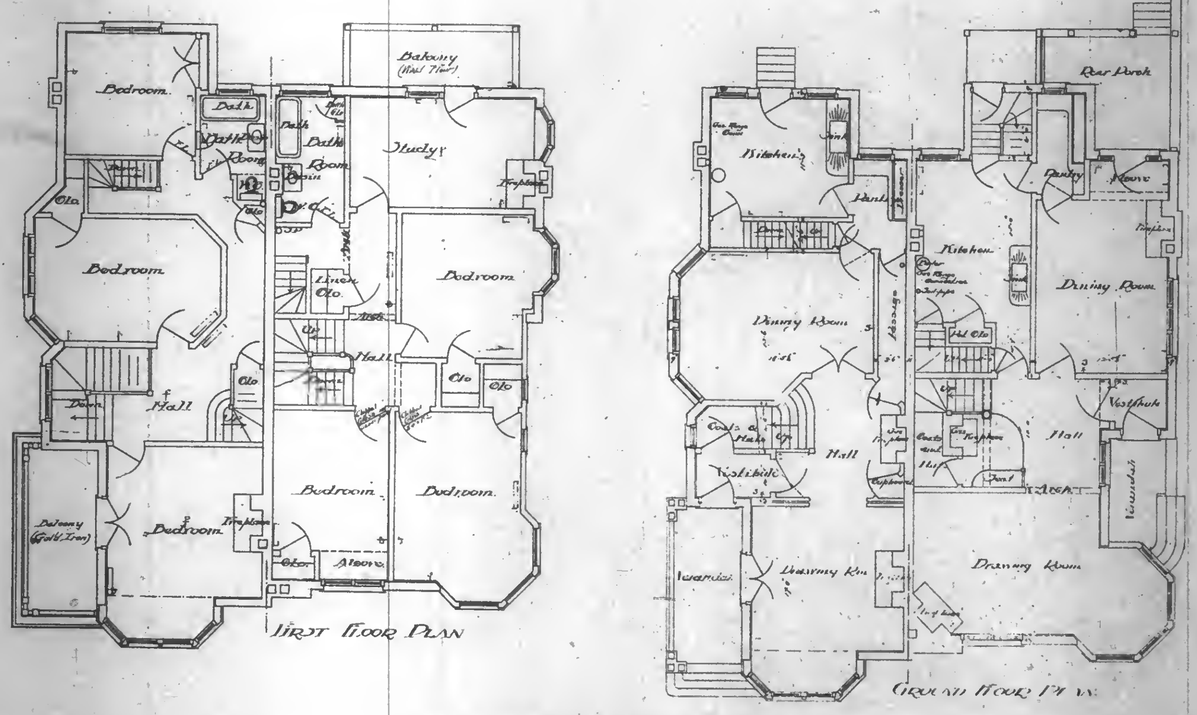
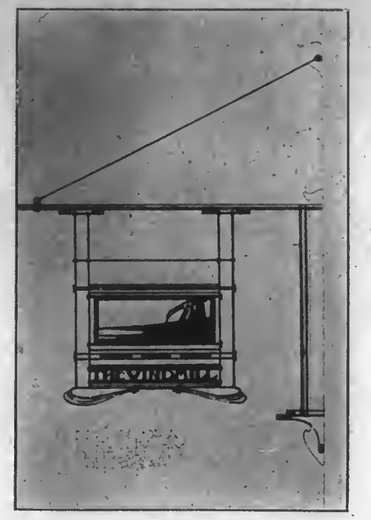
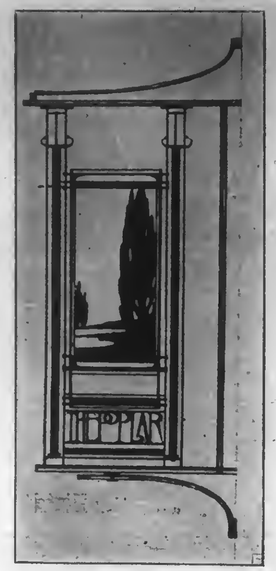
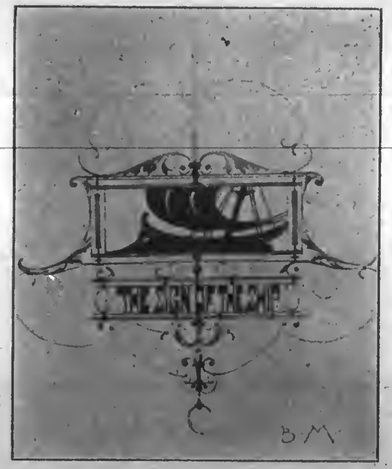


PLANS OF SEMI-DETACHED HOUSES, TORONTO.
CHADWICK & BECKETT, ARCHITECTS.







DESIGNS FOR METAL SIGNS.

BY G. S. LEMASNIE.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
OCTOBER, 1902

FOUNTAIN IN PUBLIC GARDENS AT HALIFAX, NOVA SCOTIA.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
OCTOBER, 1903

The Canadian Architect and Builder

VOL. XV.—No. 179. NOVEMBER, 1902.

ILLUSTRATIONS ON SHEETS.

Two Houses in Toronto.—Eden Smith, Architect.
St. John's Church, Toronto.—Eden Smith, Architect.
Branch of Dominion Bank, Toronto.—Eden Smith, Architect.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Photogravure Plate—Merchants' Bank, Winnipeg, Man.—A. T. Taylor, F.R.I.B.A., Architect.
Photogravure Plate—London & Globe Insurance Company's Building, Montreal.—Hutchison & Wood, Architects.
New Chemistry and Mining Building, School of Practical Science, Toronto.
Shop Front, Main Street, Winnipeg, Man.—Sketched by Percy Over.

CONTENTS

Editorial	129	Strength of Metal in Concrete Construction	135
C. A. and B. Students' Competition	130	Evolution in Design	135
Count Tolstoy on Art	131	A Fire Test for Roofs	135
Architectural Matters in Toronto	132	Standard Portland Cement Tests	136-137
An "Art Nouveau" House in Paris	133	By the Way	138
Competitions	134	Patent Store Fronts	138
School of Practical Science ; Chemistry and Mining Building	134	The Merchants' Bank of Canada, Winnipeg	139
Condition of Venetian Monuments	134	British Standard Fire-Resisting Rules	x-xi
		Contract Conditions	xii

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Glass as a Fire-Resistant.

A malleable glass is being manufactured at Matthews, Indiana, which is said to be capable of withstanding the greatest possible extremes of heat and cold, including sudden changes from the one to the other. In appearance this glass is said to be much like the ordinary product. It can be made of the thickness of a sheet of paper or as much heavier as desired. The material should prove valuable as ordinary window glass, but especially as a fire-resistant.

Insanitary Buildings.

IT is to be hoped that some definite result may follow the agitation now going on in Toronto to compel the removal of insanitary buildings. York street in that city will serve to illustrate conditions that ought not to be allowed to exist. For years this street, located in the very heart of the business district has been the abode of vice of every kind sheltered in tumble-down buildings, the owners of which reap large returns on their investments and profit largely by the improvements carried out by neighboring property owners. No doubt the local Board of Health has authority to order the removal of buildings which have become dangerous or insanitary. If so, we may hope that the Medical Health officer, who is known to be an energetic official, will now give his attention to the evil.

A Business Opportunity.

THERE would seem to be an opening in Canada for first-class furniture designer. As a result of the rapid increase of wealth in the last few years, there has come a demand for more costly residences and furnishings, and for specially designed furniture. Large orders for special furnishings have recently been given by Canadian architects to United States firms. Most of the furniture now manufactured in Canada is machine made from stock designs purchased in the United States. As a rule these designs have little or no merit, and are duplicated thousands of times so that they are everywhere in evidence. Persons who have the taste for something better and the means wherewith to buy, should in future have their requirements met by Canadian designers and manufacturers.

Esprit de Corps.

IF the profession of architecture is to be held in public respect and if associations of architects are to accomplish any useful purpose some of the members must be more particular than at present in their methods. Esprit de corps is not promoted by the knowledge that fellow architects have approached your clients and asked to be allowed to submit sketches free of cost, even after your plans have been approved and tenders thereon received. Conduct of this kind is unfortunately in evidence and

is one of the greatest stumbling blocks to the advancement of the profession. There cannot be good-fellowship among architects while petty jealousies and disloyalty prevail. Neither can clients whose attention is drawn to these things be expected to hold the profession in highest esteem.

Profitless Contracts. A Toronto contractor assures us that builders in that city are receiving very small profits from their undertakings. The times are prosperous and plenty of building is being done, but it is claimed that the keenness of competition and high prices of labor and materials are proving an off-set, and standing in the way of proper returns to the contractor. There are said to be about two-hundred building contractors in Toronto at the present time, which is far too large a number even in prosperous times like the present. Some of these men are so anxious to get a large amount of work that they tender at ridiculously low figures and thus lower the standard of prices all round. A much wiser course would be for all tenderers to allow in their estimates for a fair margin of profit, and thus assist in securing for builders their share of the results of the prevailing prosperity. If when the times are good little or no profit can be made, the outlook will be gloomy indeed when hard times shall return.

Smoke as an Explosive. A lecture was recently given by William McDevitt, Insurance Inspector, before the Fire Insurance Society of Philadelphia, in which the explosive quality of hot smoke was demonstrated. The author explained that in a fire, free carbon rises and mixes with hydrogen; methyl-alcohol, creosote and other gases are also present in smoke. These gases become heated to the point of ignition, and an explosion is the result. Of itself, smoke would explode at a temperature of from 600 to 800 degrees, but frequently the smoke is ignited by sparks or by coming into contact with a flame. Very thick smoke, when ignited, becomes a pillar of flame, and rolls through a room with such force as to shake the walls and make the windows rattle. If sprinkled with water there would be no explosion. Where formerly firemen tried to keep smoke in, under the impression that it smothered the fire, they now immediately break in windows or skylights to let it out. The construction of a central shaft in large stores and other buildings was recommended as one of the best methods of avoiding smoke explosions.

Sewage Disposal on Vessels. The beauty of the Muskoka Lakes and their value as a health resort have been published far and wide over the continent. As a consequence the number of persons who summer there is steadily increasing year by year. Dr. Bryce, the efficient head of the Provincial Health Department is keenly alive to the necessity of securing the adoption of such sanitary precautions as will maintain as nearly as possible the original purity of the air and water on these lakes. Most of the hotels, including the new Royal Muskoka, are fitted with the septic tank system of sewage disposal described by Dr. Bryce in his admirable paper read before the Ontario Association of Architects last year. Last summer the further step was taken of placing a septic tank on one of the Muskoka Navigation Company's steamers. The experiment is said to have proved entirely successful, all the sewage from the vessel with the exception of the liquids was consumed by the bacteria in the tank. It is probable that next year all the steamers on these lakes will be provided with septic tanks, thus stopping to a large extent the pollution of the water and greatly reducing the possibility of the spread of disease.

C. A. & B. STUDENTS' COMPETITION.

The publishers of the CANADIAN ARCHITECT AND BUILDER invite architectural students in Canada to submit designs in competition for a suburban or town house to cost not more than $2,500.

The building is to be designed for an inside lot having a frontage of 50 feet, situated on the west side of a street running north and south. The adjoining lots on either side have houses on them 30 feet back from the street line and 10 feet from lot line on either side.

Competitors are required to submit two elevations or a perspective, together with plans of basement, ground, first and attic stories, drawn to ⅛ scale in a manner to permit of reproduction within the limits of a double page of the CANADIAN ARCHITECT AND BUILDER, viz., 10x15 inches in size, also details to a larger scale of important or special features of the design. Drawings must be made with PEN and PERFECTLY BLACK INK on WHITE DRAWING PAPER, OR CARDBOARD. NO BRUSH WORK WILL BE ALLOWED.

Competitors should state the materials proposed to be employed in construction.

Drawings for this competition should be signed with a motto only and be accompanied by a sealed envelope bearing the same motto and enclosing the full name and address of the designer and the name and address of his principals. They should be sent FLAT by post or express, charge prepaid, addressed "CANADIAN ARCHITECT AND BUILDER, Toronto, Canada—Student's Competition," and must reach this office not later than noon on Saturday, January 10th, 1903.

The members of the joint Educational Committee of the Toronto Chapter of the Ontario Association of Architects and the Toronto Architectural Eighteen Club have kindly consented to judge the designs submitted in this competition, and their decision will be final.

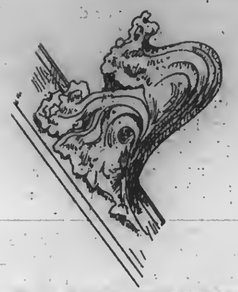
The prizes offered are: First prize, cash $15.00; second prize, cash $10.00, third prize one year's subscription to the CANADIAN ARCHITECT AND BUILDER ARCHITECTS' EDITION.

The publishers of the CANADIAN ARCHITECT AND BUILDER reserve the right to publish any of the designs submitted and to withhold the prizes if in the judgment of the jury the designs should not be found worthy of the awards.

Intending competitors are requested to read carefully the conditions of competition, and to strictly comply with the same in every particular.

Messrs. Ouellett & Levesque, architects, of Quebec, have registered a partnership.

A brilliant dark green for front gates or doors can be got by first and second coating on old work with two coats of Prussian blue and at least two of verdigris, to be finally finished with good, clear varnish, when the work, if properly done, will last for years, and cannot be successfully matched with any other greens on the market.



SCREEN, NORTH AISLE—AMIENS CATHEDRAL.

COUNT TOLSTOY ON ART.

Count Leo Tolstoy, in his book entitled "What is Art? makes a contribution to the question which can hardly fail to affect the progress of art in Europe.

Before making his own definition of art he gives a summary of the views of aestheticians for over 200 years, which must have cost him much labour. It is not easy reading and the conclusion he brings us to is that it is not profitable reading, because the object of the aestheticians is to discover the nature of art by the consideration of examples of all kinds — bad as well as good — and devising a definition of art to cover all these productions. The result of these investigations is a general conclusion on the part of the aestheticians that beauty is the object of art: "that art is that which makes beauty manifest, and beauty is that which pleases." Feeling the instability of this definition of beauty, "many aestheticians have asked themselves why a thing pleases," and "have converted the discussion on beauty into a question concerning taste," and there it squanders. There is no explanation of why a thing pleases one man and displeases another. So that the science of aesthetics fails as a science. "It does not define the qualities and laws of art, or of the beautiful (if that be the content of art), or the nature of taste (if taste decides the question of art and its merit), and then, on the basis of such definitions, acknowledge as art those productions which correspond to these laws and reject those that do not come under them."

Tolstoy quarrels with both the system and its result. He objects to the aim and purpose of art being considered to be the pleasure we get from it, as much as he would object to its being considered that the purpose and aim of food is the pleasure derived when consuming it. He proposes to define art first, and then decide what is and what is not good art by judging whether a work conforms or does not conform to the definition.

"In order to correctly define art," he says, "it is necessary, first of all, to cease to consider it as a means of pleasure, and to consider it as one of the conditions of human life. Viewed in this way we cannot fail to observe that art is one of the means of intercourse between man and man." The peculiarity of this means of intercourse he finds to be that whereas by means of words men transmit their thoughts, by means of art they transmit their feelings.

In order to be a true work of art the feelings transmitted must be the artist's own feelings, which he has lived through either in actual experience or by his imagination. It does not matter what the feelings are, whether they are strong or weak, bad or good: "feelings of love for native land, self-devotion and submission to fate or to God expressed in a drama, raptures of lovers described in a novel, feelings of voluptousness expressed in a picture, courage expressed in a triumphal march, merriment evoked by a dance, humour evoked by a funny story, the feeling of quietness transmitted by an evening landscape or by a lullaby, or the feeling of admiration evoked by a beautiful arabesque—it is all art."

He therefore makes the following definition:—"Art is a human activity, consisting in this, that one man consciously, by means of certain external signs, hands on to others feelings he has lived through, and that other people are infected by these feelings, and also experience them."

This is art—the definition seems indisputable—but it is not by any means the whole matter of the treatise. The author reaches this definition in 50 pages but there are nearly 200 beyond. He has still to mark off the classes of work which, though they have been usually considered to be art, do not conform to this definition, and to reject the classes of work which, though they do come under the definition and must be called art, cannot be upheld as serving any useful purpose.

The first of these two heads is of the greater immediate interest to architects.

In order the better to distinguish true art from false, Count Tolstoy traces the course of art from the early centuries of Christianity, when renunciation of the world was the motive of life, and art renounced the transmission of feelings of personal enjoyment; through the Middle Ages when, under the inspiration of the church, pious adoration, the fear of hell and the hope of heaven were the themes of good art; to the time of the Renaissance when the rich and powerful, no longer able to believe in Church religion and incapable of accepting true Christian teaching, stranded without any religious conception of life, involuntarily returned to that pagan view of things which places life's meaning in personal enjoyment. It is here he finds not only a great impoverishment of the subject matter of art but the source of the involved, affected and obscure art which has since grown up.

Art does seem at the time of the Renaissance to have fallen into a whirling gulf from which there is no advance, and the change of motive from religious feeling to pleasure would sufficiently account for it; for the satisfaction of pleasure brings merely satiation, while the satisfaction of religious feeling is a renewal of impulse.

In leaving the way of religious feeling and devoting itself to the satisfaction of easily staled enjoyment, art lost the greatness which belongs to it only when it is comprehensible to every one, and became an amusement of the upper classes; in consequence of which, in the pressure of meeting demands for art which did not spring spontaneously in the artists' inner self, artists have had to devise methods of producing imitations of art.

These methods are those of (1) borrowing, (2) imitating, (3) striking (effects), and (4) interesting.

"The first method consists in borrowing whole subjects, or merely separate features, from former works recognized by every one as good works of art and so re-shaping them with sundry additions that they should have an appearance of novelty." This method in its

adaptation to architecture, requires no comment. We are all familiar with it : indeed it seems as if whole fields of work in modern architecture are founded upon this method, and that a great part of modern architecture is a counterfeit art.

The second method (that of imitating) is shown in literature and the drama by dependence upon realism, in music by the attempt to imitate sounds, in painting by the photographic method. In architecture, imitation is too troublesome to be a temptation.

To imitate by architecture structures which are outside the field of architecture requires at least constructive invention. The temptation in architecture is to imitate itself ; to adapt to one branch forms which are only proper in another. It is this which gives us armouries that look like fortresses and which produced Wemmick's castellated cottage.

In the third method (striking) "the effects consist chiefly in contrast;" in bringing extremes together, and producing variations from the ordinary which strike by their unexpectedness. In painting Count Tolstoy describes the "chief and usual effects" to be "effects of light and depiction of the horrible." In architecture it is the creation of the horrible we have to guard against, and perhaps it is best done by applying the old rule for young writers that the part where one is conscious of effect is the part to score out : in other words not to try for effectiveness at all. Architecture consists not in effects but in idea : effects may strike but it is only the idea that infects.

The fourth method—that of interesting, that is too say of absorbing the mind with matter connected with the work—is the most plausible of all the counterfeits of art, for the interest does reside in the work and it is easy to mistake the excitement of interest for the transmission of feeling ; but as a matter of fact the occupation of the mind in this way rather hinders than assists artistic impression—or, to use a word which expresses Count Tolstoy's doctrine better, artistic infection. It is in this way that—to take an example from architecture—those residences which have a classic hall, a Jacobean dining room, a Gothic library, an English drawing room, and a Rococo boudoir fail to impress one with any feeling for the work as a whole, but to excite rather the somewhat wearying interest that one takes in a museum.

Art then is only real art when it infects the spectator (to confine ourselves now to architecture) with a feeling which is original with the artist. If it is original with the artist it must be new to the beholder, and Tolstoy says, "An art-product is only a genuine art-product when it brings a new feeling (however insignificant) into the current of human life." It is this effort after something new that has led designers to aim at what is striking or interesting. It is a mistake. The path to originality lies in renouncing originality. This is no great paradox when we come to see what it means.

Whoever heard complaints of monotony in the appearance of the human face? The poet may write "a sonnet to his mistress' eyebrow," fifty times and not repeat himself, if he only has fifty mistresses. No artist tries to improve upon the human nose when he paints a face. Ridiculous as the human nose is, its Creator has made it a beautiful object when its proportions are strictly suited to its needs. Striking effects do not improve it, nor do interesting embellishments. Why then should we hope to improve our own creatious by going outside of their functions for our inspiration? Why when we wish to procure the charm of freshness in our work in spite of the similarity of one problem to another, should we seek for any other inspiration than its functions, when we see how the human nose, with its similar functions and its similar form in all the multitudes of men, is nevertheless always new?

Here is Count Tolstoy's recipe for the production of infectious—that is to say of original—art. "The stronger the infection," he says "the better is art, as art, speaking now apart from the subject matter.

"(The fourth quarter of his book is devoted to the condemnation of much of the subject matter mentioned in the quotation from him, in the earlier part of this article, as being art. He considers no art to be good art which does not transmit either the feelings of religious perception or the simplest feelings of common life. And its function as one of the means of human intercouse is to unite men in feeling. Hence he excludes all art that transmits church or patriotic feeling or the feelings pertaining exclusively to the aristocratic and idle rich. These views however cannot be considered in the present article).

To return to the recipe for producing infection. Count Tolstoy says : "the degree of the infectiousness of art depends on three conditions.—(1) On the greater or lesser individuality of the feeling transmitted ; (2) on the greater or lesser clearness with which the feeling is transmitted ; (3) on the sincerity of the artist, i. e. on the greater or lesser force with which the artist himself feels the emotion he transmits."

Now these three conditions may, as the author himself says, be summed up in the last, sincerity ; for if the artist is sincere—as each man is different from everyone else, his feeling will be individual for everyone else ; and, if he be sincere, he will be sure to to be clear.

It is thus that renunciation of originality is the way to originality, for the designer must lose himself in his problem if he is sincere. And the encouragement to do so is that it is only when this imagination is thoroughly infected with his problem that he can express it so as to infect with his feeling those who look upon his work.

W. A. Langton.

ARCHITECTURAL MATTERS IN TORONTO.

The Toronto Chapter of the O.A.A. have decided to establish for the benefit of the members a class on the History of Architecture. The first meeting will be held in the O.A.A. rooms, 94 King Street, West, on the first Monday in December between the hours of 5 and 6 p.m. Under the direction of Mr. W. A. Langton the class will first take up the Norman period, and later the Early English period under the direction of Mr. John Gemmell.

A Committee composed of Messrs. Symons, Wickson and A. H. Gregg has been appointed to take charge of the scientific classes in connection with the educational work to be undertaken jointly with the Toronto Architectural Eighteen Club. Professional teachers will be employed for these classes, which will be of such a character as will prepare students for entrance to the School of Practical Science.

On the evening of the 11th inst. the members of the Toronto Chapter and of the Toronto Architectural Eighteen Club met in the rooms of the Association and discussed with Mr. A. F. Wickson the revision of the city building by-laws.

AN "ART NOUVEAU" HOUSE IN PARIS.

The Parisian who, starting from the Bois de Boulogne or from the Place de l'Etoile, walks along the Avenue Victor Hugo and turns into the Rue Saint-Didier, sees on his left an edifice of very novel aspect. In front, fenced off from the street by an ornamental railing of light construction, there is a court-yard, partly covered, and on the left of this court-yard a building of a character hard to define, but which gives one the idea of a chapel whose distinctive signs are hidden by details thoroughly modern in style. Behind the court-yard and chapel stands a spacious hall, the dome of which dominates all the rest. This hall is fitted up for concerts. Everyone who passes in front of the edifice asks himself: "Whatever can this be? What is this mixture of things so dissimilar—a court-yard, a chapel and a concert hall?" What it has been intended to build at No. 60, Rue Saint-Didier is an edifice of a special kind, comprising two things, namely, a public hall and a patronage. (A patronage is a sort of school where the children and young people who attend it are taught morality and religion.)

This edifice is called the "Ecole Humbert de Romans," after an ancient monk known by his writings on religious art, and particularly on sacred music. It is also a monk, the Pere Lavy, belonging to the Dominican order, who is the originator of this edifice. His idea was that it should be a school of divine art—a sort of religious and popular Conservatoire. Thanks to his great influence among wealthy people in Paris, the Pere Lavy succeeded in collecting about £40,000 for the erection of his academy. What interests us is the structure itself, the architect of which is M. Hector Guimard, who came into prominence as an exponent of the new architecture when he designed the stations of the Paris Metropolitan Railroad.

The edifice in the Rue Saint-Didier had to comprise a concert hall capable of holding from 1,500 to 2,000 persons. It had to have a gallery. On one side there was to be a stage, with a grand organ at the back of it. Besides the hall itself there were to be the necessary subsidiary buildings, such as the cloakrooms, lavatories, vestibules and so forth. The establishment also had to have a janitor's lodge, a chapel 27 metres long by 8 metres in width for the accommodation of the Pere Lavy, and a patronage communicating directly with the hall.

The principal facade, as already stated, is on the Rue Saint-Didier. In front of its central part, however, there is a fairly spacious court-yard, separated from the street by an ornamental iron railing 7ft. high. Entering by the doorway on the right, one first reaches an outer vestibule, in which there is a vestiary, fitted up in such a manner that the garments are hung upon pegs. Two other vestibules lead out of this first one, and the effect is that the hall has wide exits on three of its sides. These vestibules all have a floor in pink imitation marble with a pattern of lilies and golden nenuphars. They are built of stone, iron and cement, like all the lower part of the edifice, and thus are practically fireproof. They communicate with the hall by a continuous row of doors, which arrangement is very convenient and constitutes, moreover, a safeguard in case of fire.

The hall is 29 yds. long and 25 yds. wide. It is formed of a visible structure, springing from the ground at each corner and spreading in curves like the branches of an immense tree, in a way which gives one some what the idea of a corner of a Druidic forest. The main branches, eight in number, support a rather high cupola, pierced, like the sides, with bays filled with pale yellow stained-glass, through which an abundance of light finds its way into the hall. The framework is of steel, but the metal is covered with mahogany in all visible places. What is in reality a thin strip of steel thus has the appearance of a thick beam. The pillars, for example, measure as much as 20 in. by 15 in. at the foot and 11½ in. at the top. The principal rafters also measure 11½ in. each way, and the principal tie-beams begin with 15½ in. and finish with 10 in. on each face. Nevertheless, the tie-beam being 35 ft. long has a light and elegant appearance, owing to the great distance between the supporting points. Three hundred cubic meters of mahogany were used for the framework, and the result is the most elaborate roof ever conceived by a French architect. The mahogany is polished, has a warm red colour, and stands out from voussoirs of the ceiling, which are painted orange colour, shaded gradually lighter in the direction of the spectators. These voussoirs, between the rafters, are in plaster, decorated with antique masks and with trumpeters in the corners. A part of the ornamentation has been done in sheet-iron and forged iron platbands. To the arched buttresses electric lamps are fixed in groups of twelve, having the appearance of branches of strange fruit on foliations of iron.

At the bottom of the hall there is a platform or stage, and a fine organ with forty-four stops, built by Abbey. The case of the instrument is of mahogany, in the same style as the hall. The stage is large enough to hold 100 musicians and 120 choristers.

The hall contains 1,150 numbered seats, but there is so much unoccupied space that an audience of 1,500 or 1,600 could easily be accommodated. The armchairs are roomy, with plenty of space between each row, and they are placed quincunx-wise, in order that everybody may have a clear view of the stage. These chairs have a light cast-iron frame in the form of branches ; the seat is of green leather, stamped with curves and volutes. Two staircases lead to the upper floor, which is provided with armchairs similar to those in the hall below. On the left there is a spacious room suitable for use as a lobby or as a promenade. The balcony of this floor is in iron, and it is decorated, like the balustrades of the two staircases, with lyres and musical notes. The acoustic properties of the concert hall are excellent. It vibrates extremely well, and has no annoying echo. It is an ideal hall for stringed instruments and for the voice. It vibrates almost too much for brass instruments, which have to be moderated. M. Camille Saint-Saens gave some valuable hints in this connection, and it was upon his advise that M. Guimard, in order to obtain the requisite sonorousness, planned a proper distance between the ceiling and the roof of the hall, so that they should have a cushion of air between them.

The exterior of the edifice is built of free-stone, with certain parts in millstone, brick and iron. The carving, which is interesting here and there by reasons of its fanciful treatment, has been done from models composed by M. Guimard himself, who also designed all the ornamental tiles.—The Builders' Journal.

COMPETITIONS.

A prize of 3000 lire is offered by the municipality of Venice for the best design submitted for a large gold medal to be awarded to the most important works shown at the International Art Exhibition of 1903 to be held in that city. Competitors are required to submit wax or plaster models to the exact diameter of 120 mm., accompanied by photographic reproductions 40 mm. in diameter, which will be the size of the medal. These must reach, postpaid, the office of the Secretary of the Exhibition not later than the 31st of January next, and must be signed with a motto, and be accompanied by a sealed envelope containing the full name and address of the author. The committee of award consists of the Mayor of Venice, the President and Secretary of the Exhibition and three artists.

SCHOOL OF PRACTICAL SCIENCE; CHEMISTRY AND MINING BUILDING.

On concrete foundation walls now in place at the head of McCaul Street, Toronto, the Ontario government are proceeding to erect the brown stone and brick building shown in front elevation, in illustration plate, as it will appear from College street. The plan will cover about 262 feet from east to west, with two wings, of which the western will have a depth of about 130 feet and the eastern 102 feet. It will be placed about 30 feet back from the street line. This building is for the accommodation of the Departments of Chemistry and Mining of the School of Practical Science. Students in all departments of the school will thus attend this building for all lectures and laboratory work in Chemistry and Metallurgy, as well as the students in Chemistry and in Mining Engineering. The accommodation provided in this building will also be made to suffice for the classes in Mineralogy and Geology in the Faculty of Arts.

In addition to a sub-basement for pipes, there will be four floors available for purposes of instruction and research. A main corridor runs east and west on each floor, from which access is obtained to rooms on each side as well as to the two wings of the building. Ventilating fans will be provided in the basement which will deliver fresh air, screened from dust, and warmed if necessary by steam coils to 70 degrees Fahrenheit, to the different rooms; but in winter the main heating will be done by radiators distributed through the building and used as required. The air will also be exhausted by fans in the attic when it is desired to have better ventilation. In this manner the ventilation and heating in each part of the building are separately under control.

The steam coils and radiators while in use will be supplied wholly or partly from the exhaust steam of an engine driving a D. C. dynamo, from which the ventilating fan motors will be supplied, as well as the current for lighting the new and the old building. At other times the usual city service will be used.

The museums for minerals and geological specimens will occupy an area about 50x80 feet in the east wing. In addition to lecture theatres, chemical, mineralogical and assay laboratories, metallurgical furnaces, and work rooms for fossils and minerals, lithology and crystallography, there will be a number of rooms for special purposes, such as calorimetry, gas analysis, toxicology, photography, electrolytic assay, fire-proof and constant temperature rooms.

Next spring the Milling Building of one storey, about 75 feet square, will be begun on ground at present occupied by the old Wycliffe College building, immediately north of the centre of the new building. The Milling Building will be equipped with such appliances as are usual in modern milling laboratories, such as stamp mills, vanners, rolls, separators, leaching plant, etc.

CONDITION OF VENETIAN MONUMENTS.

The Commission for the Inspection of Venice Monuments has presented the following report:—

The Doge's Palace.—The Commission is not aware that anything new threatens its stability, but the weight of the books of the Marciana Library must be removed.

The Procuratie Vecchie.—In this building, which forms the north side of the Piazza of St. Mark, the whole of the internal arrangements have been altered to meet the needs of trade and commerce. Besides which tons on tons of goods, a large part of which consists of glass, are stored there. Consequently cracks have appeared, and though there is no danger of collapse, still work of restoration is urgently needed. Signor Boni said he should like to see the buildings turned into dwelling-houses, thus restoring them in great part to their original use.

The Campanile of S. Stefano.—The upper half of this campanile was rebuilt after the destruction caused by lightning in 1585, but it is precisely this part that now threatens to fall. It is nearly 6 feet out of plumb. Signor Boni has therefore ordered the demolition of the newer upper half.

The Campanile of S. Barnabas.—Near the base of this campanile cracks and bulgings have been discovered. The Commission have, therefore, ordered the cessation of the ringing of its bells and they contemplate immediate repairs.

The Campanile of San Francesco della Vigna.—The Commission finds that this campanile needs strengthening. Its bells, too, have been ordered to be quiet. Signor Boni says it may have been built too near the banks of some old canal.

The Bell Tower of the Arsenal, in which hung the modern "Marangona" that called the workers to their labours, has been condemned to undergo repairs. The bell has been swung to the top-mast of a ship, and meantime does duty there.

The Church of Mater Domini is dark, and low and dismal, and the Commission report it to be in a positively deplorable condition. It will have to be closed and thoroughly overhauled and restored.

The Church of the Maricoli, considered to be one of the most beautiful Renaissance churches in Italy, has been ordered to be closed so that the necessary work may be done to preserve it.

A controversy is going on in the eastern States as to the point at which building operations begin. On the one hand it is contended that the point of commencement is the excavation. Against this C.H. Blackall, a prominent Boston architect, states that in his own experience about 10 years ago the city solicitor had decided that for a building to have been begun it was not sufficient for the excavation to have been made, but that some of the actual permanent construction of the building must be in place.

STRENGTH OF METAL IN CONCRETE CONSTRUCTION.

Summing up the results of a recent series of tests carried out by the Mininstre des Traveaux Publiques of France, to exactly determine the part played by the metal in ferro-concrete constructions, M. Considere states in a report to the French Academy of Science, that concrete-steel submitted to tension acts precisely as ordinary concrete, so long as the tensile stress does not exceed the usual breaking stress of ordinary concrete. Under higher stresses it will support without breaking extensions which, in the case of specimens hardened under water, have been as great as 1/500th the total length; and, in the case of air-hardened concrete, have ranged between 1/2000th and 1/850th of the total length. When the concrete-steel is stretched beyond the usual elastic range of ordinary concrete, the tensile stress on the concrete remains constant up to the ultimate breaking-point, the whole of the additional load being taken up by the metal. When subjected to repeated tensile stresses, however, the fraction of the load carried by the metal tends to augment, and that of the concrete to fall, until ultimately the working stress on the concrete is only 70 per cent. of its original value. If finally, after a series of loadings and unloadings, the maximum load is raised 30 per cent., the concrete again exerts a tensile resistance equal to its primitive value.

EVOLUTION IN DESIGN.

In an article in the Magazine of Art for September on modern decorative art as shown at the Turin Exhibition, Mr. Walter Crane says: "There appears to be a law of evolution working in the arts of design quite as inevitably as in the natural world. Certain germinal motives, derived from forms in nature or art, are combined by the fancy of the designer. A conflict for pre-eminence, a struggle for existence, takes place in the mind of the artist, as his hand records the stages of the evolution of his design, either on paper or in some plastic material. In view of his ultimate purpose—the use and destiny of the design—certain lines, certain forms, prevail over others as the most fitting; the design sheds inessentials and takes final shape. It may closely follow the principle of its inception, or it may, passing through a multitude of complex stages, finally be evolved in some very different shape; but in either case its development proceeds much as the development of a plant from its seed germ to its full completion and flower, always strictly adapted to its environments. I would not say that forms of design, say surface design, are always so strictly adapted, and one must always, of course, allow room for individual caprice and wilful extravagence and the desire for originality. The limits, however, of even these apparently spontaneous impulses are more restricted than might be supposed. Efforts to be new and original sometimes lead to results curiously similar in form to work of former epochs, where the constructive principle in design has been obscured. For instance, I noted in more than one new art restaurant building in the Parc Valentino (near the exhibition buildings) that which, in its general masses and distribution of ornament, in its absence of rectangles or verticals, or constructive feeling, curiously recalled buildings of the late eighteenth century, or what would be called in Hungary 'Maria Therese' type. Extremes meet, and our twentieth century new art touches, in its least consciously artistic form, the rococo decorative confectionery of the palaces of the eighteenth century.

A FIRE TEST FOR ROOFS.

Tests were recently conducted by the British Fire Prevention Committee of a slated roof and ceiling and a flat roof covered with vulcanite roofing and ceiling. The test lasted one hour, the temperature reaching 1,700 degs. Fahr., followed by the application of water for three minutes. Each floor was 100 feet super., and four weeks were allowed for construction and drying. The slates were "American green," measuring 20 in. by 10 in. by 3-16 in. thick, with a 2½ in. lap, and the ridge covered with blue Staffordshire ridging. The laths were of sawn spruce 1¼ in. by ¼ in. Gutters lined with No. 14 gauge (Vielle Montagne) zinc. The Vulcanite roofing was covered with 2½ in. of gravel and sand. The following is a summary of the effect of the fire:—In fifteen minutes the plaster to the ceiling of the slated roof began to fall; in twenty minutes the inside of this roof was well alight; in forty minutes the plastering of the Vulcanite roof began to fall; in forty-one minutes the slates on the other roof began to fall; and in forty-seven minutes the whole of the slate roof collapsed; while in fifty-four minutes the underside of the Vulcanite flat was a sheet of flame, but after sixty minutes the fire had not passed through it, and it was sound enough to walk upon.

NOTES.

The new King Edward Hotel, Toronto, which is rapidly nearing completion, is being elaborately decorated. It is understood that for the figure work in the dining room living models were employed. The furnishings, many of which are being purchased abroad, are also of an artistic and expensive character.

Work is to be begun at once on the rebuilding of the fallen Campanile, at Venice. Expert examination has proven that the foundations are intact and sound and can be utilized with perfect safety. Three hundred thousand dollars have already been subscribed, one-half of the estimated cost of rebuilding.

The authorities of Paris have recently established a scale of architects' fees for municipal work, as follows:—for buildings costing more than $160,000 4 per cent. on the cost; for buildings costing $120,000 to $160,000, 4½ per cent.; for buildings costing from $80,000 to $120,000, 5 per cent; from $40,000 to $80,000, 5½ per cent.; under $40,000, 6 per cent. The right is reserved to increase or diminish the fee as the character of the work may justify.

"I am old-fashioned enough," says Mr. John Slater, Vice-President R.I.B.A., "to think that an architect ought to try to make his building beautiful, and that a protest should be made against what appears to me to be the cult of ugliness which has been growing of late years. There is too great a tendency nowadays to mere eccentricity and originality among the younger men. There have been several buildings erected lately the cleverness—I had almost said the infernal cleverness—of which cannot be denied for one moment; but are they beautiful?"

The restoration of the Madeleine at Paris, which was decided upon about seven years ago, is only now about to be commenced. It is presumed that the recent fall of the Campanile has created alarm for the safety of the structure. It is believed that sufficient data have not been obtained from which to compute an exact estimate of the cost. It has therefore been decided to expend about 40,000 frs. on the erection of a scaffold, which will enable every part of the building to be examined. The structure will be movable, in order that along the four sides of the building the slightest defect in any of the details can be observed. The design for the present building was the work of Vignon, and was adopted because it pleased Napoleon beyond any of its rivals. But a few years before the revolutions two sets of designs for a church on the site were prepared, one by Constant d'Ivry and the second by Couture. The work which is about to be restored was completed sixty years ago.

STANDARD PORTLAND CEMENT TESTS.*

All experiments shall be carried on, as nearly as possible, at a uniform temperature of 65 deg. Fah., except when tests are being made for the purpose of ascertaining the comparative strength of cements required for winter use.

(1) PROPORTIONS.

All proportions shall be determined by weight.

(2) FINENESS OF CEMENT.

For the present, a maximum residue of 10 per cent on the 100 x 100 mesh sieve shall be the test for fineness, and the whole of the cement shall pass a 50 x 50 mesh sieve. The gauge (Stubb's) of the wire shall be No. 35 for the 50 x 50 sieve, and No. 40 for the 100 x 100 sieve. A mechanical sifter, working automatically by jig motion, and thus eliminating personal error, is recommended.

In the case both of hand mixing and sifting with the mechanical mixer, the process shall occupy a definite time, depending upon the weight to be sifted, and the diameter of the sieve. For example, with a weight of 10-oz. of cement, and sieves 8-in. in diameter, the sifting shall be continued 2½ minutes on No. 120 sieve,, 1 minute on No. 100, ¾ minute on No. 60, and ½ minute on No. 50.

The introduction of small weights, such as washers, into the cement, while being sifted, is to be deprecated, as they tend to push an undue proportion of the cement through the mesh, to stretch the wires and to increase to some extent the grinding. Such practice should not be allowed, excepting on works of construction, where there may be a necessity for ordinary rough tests.

The sieves shall be periodically examined with great care, as moisture sometimes collects on the wire, so that when a residue test is made this moisture mixes with the cement, causing a coating on the wires, and often appreciably diminishing the area of the mesh.

The sand for standard tests shall be quartz, crushed so that the whole can pass through a 20 x 20 mesh sieve (wire No. 28 Stubb's gauge), but sufficiently coarse to allow of the whole being retained by a 30 x 30 mesh sieve (wire No. 21 Stubb's gauge).

(3) SPECIFIC GRAVITY.

The specific gravity is for the purpose of determining the degree of calcination of a cement with certainty, and is therefore of great importance. The specific gravity of a Portland cement shall be at least 3.09, and shall not exceed 3.25 for fresh cements, the term "fresh" being understood to apply to such cements as are not more than two months old. The gravimetric system is recommended for the determination of the specific gravity.

Portland cement improves with age, provided it is properly stored and kept in air-tight bags or barrels. Specifications, therefore, should not prescribe only fresh cement.

The following description of the method of carrying out this test is taken from a paper on "Testing of Portland Cement," by Gary, Trans. Amer. Soc. of Civil Engineers, October, 1893:

"The determination of the specific gravity of the cement particles by the volume-meter of Schumann is a well known uniform method. This consists of a glass bottle of about 200 cu. cm. (12.2 cu. in.) capacity, with a calibrated glass tube in its neck. The bottle is nearly filled with oil of turpentine, the tube tightly inserted and filled by a pipette with the same oil to the zero mark of the scale, care being taken that all air bubbles are removed. One hundred gr. (3.5 oz.) of cement is put in through the tube, which is then closed by a cork. When the fluid becomes clear, the height of its top surface is noted on the scale. The weight of the cement divided by its volume, as determined by the scale of readings, gives the specific gravity. To secure precise results, it is necessary that the temperature should remain uniform throughout the experiment, and hence vessels, cement and oil must have been kept in the same room for some considerable time. In hot weather the apparatus can be put into water of a known constant temperature. If 100 gr. of cement are used, a rise of 1 deg. Cent., between the two readings decreases the specific gravity 0.8 per cent."

(4) BLOWING TEST (FOR FREE LIME, ETC.)

The hot bath test for detecting the presence of free lime, etc., shall be carried out in the following manner: Mortar pats, prepared of neat cement and thoroughly worked, shall be troweled upon ground glass plates (carefully cleaned, preferably with acid) about 5 inches long by 2½ wide, and ¼ inch thick, so as to exclude all air and moisture.

The pats shall be about ½-in. thick in the centre, and shall be worked off to sharp edges on the four sides of the plate. They shall then be covered with a damp cloth and allowed to remain in the air until set, after which they shall be placed in vapor in the Faija bath tank, in which the water is to be heated to a temperature of about 130 deg. Fah. After remaining in the vapor for 6 hours, including the time taken to set in air, they are to be immersed in hot water, and allowed to remain there for 18 hours. Upon their removal from the bath, the samples should not be curled up, should not have fine hair cracks nor be distorted, and should not have large expansion cracks. The samples, if separated from the glass, should break with a sharp, crisp ring. If these conditions are satisfactorily fulfilled, it is believed that no free lime is present in a form that will prove detrimental. Cements, when very finely ground, even if slightly overlimed, are not so liable to blow.

(5) TIME OF SETTING.

The time of setting shall be determined by noting the time required for a sample under test to bear a needle of 1/12-inch diameter loaded with one-fourth of a pound, and one-twenty-fourth of an inch in diameter loaded with one pound, the mortar under test being of the consistency of rather stiff plaster or mortar. The percentage of water used shall be stated in the report.

(6) TENSILE AND COMPRESSIVE TESTS.

The strength of Portland cement shall be determined by testing a mixture of cement and quartz sand. The tests shall be made in a uniform manner (both for tension and compression) with briquettes of the same form and same cross section and with the same apparatus.

Neat cement. Neat tests, except where fineness, specific gravity and hot bath blowing tests are also made, are misleading as to the value of a cement. Briquettes of neat cement, in which these characteristics have been determined and found to be satisfactory, shall bear a tensile stress of 250 pounds per square inch at the end of three days; 400 pounds per square inch at the end of seven days, and 500 pounds per square inch at the end of 28 days. All briquettes shall be one day in air, under a damp cloth or in a damp chamber, and submerged in clean water for the remainder of the time periods. Any cement which shows a decrease in strength on or before the 28th day is to be rejected. The decisive tests shall be considered as the average of five briquettes, although for ordinary practice two or more briquettes may be sufficient, and, in the latter case, only the highest test of the group is to be taken as the strength of the cement.

In determining the tensile strength of a briquette, the area of the broken surface shall be measured with great accuracy, as errors sometimes exceeding 10 per cent. are possible unless such measurements are insisted upon.

Sand and Cement. In sand test, the sand and cement must be thoroughly mixed together while dry. After the water has been added, either for neat or sand tests, the mortar shall be thoroughly mixed for a uniform time; suitable periods being two minutes for machine mixing and five minutes for hand mixing.

Briquettes made of one part cement and three parts standard sand, in the manner described hereafter, shall stand 125 lbs. per square inch at the end of seven days, and 200 lbs. at the end of twenty-eight days.

At the end of the same period the minimum compressive strength of a mixture of one part cement to three parts sand shall be 2,000 lbs. per square inch.

[Note. Quick setting cements generally show a lower strength than that specified above.]

The tensile strength of briquettes mixed in the proportion of 3 to 1, or of other sand briquettes, shall not show a decrease either on the twenty-eighth day or subsequently.

In every case the quantity of water used in mixing shall be stated in the report.

The quantity of water to be used in neat tests varies with the kind of cement, fineness, etc., and hence no arbitrary quantity can be specified, the correct method being to bring all mortars to the same degree of plasticity. An apparatus similar to "Vicat's," and consisting of a needle having an area of 0.4 square inches weighted to about 11 oz., may be used.

"The tests are made as follows: A ring, 1½-in. in height and 3-in. in diameter, made of non-absorbing material, is placed on a glass plate and filled with the mortar to be tested, the consistency being such that the needle does not entirely pierce it." (Trans. Amer. Soc. Civil Engineers, Oct. 1893.)

A simple method for determining the standard consistency neat cement tests is to mould a ball of mortar in the hands to a plastic state and drop the same about 20 inches on to the table. If the ball of mortar neither flattens appreciably nor cracks, the consistency is satisfactory. This process corresponds practically with the previous method. The water for standard consistency of 3 to 1 sand briquettes shall ordinarily be 10 per cent. of the sand and cement by weight. If the amount of water for standard consistency of neat cement of any particular brand be less than 20 per cent. then the amount of water for standard consistency of 3 to 1 sand briquettes for this particular brand shall be one-half of the amount used in neat tests.

(7) PREPARATION OF BRIQUETTES.

(a) HAND-MADE.

(1) Neat Cement. The moulds shall be slightly oiled on the inner side and placed upon a metal or glass plate. The mixture of cement and water shall then be thoroughly worked together (preferably in a Faija's mixer) for five minutes. The moulds shall then be filled well above the rim, so that the mortar presents a convex surface. With an iron trowel the mixture shall then be patted, commencing at the side, first gently and then harder until it becomes elastic and water appears upon its surface. No after addition of the mixture shall be allowed, as the briquettes must be of uniform density throughout. The superfluous cement shall then be removed and the surface smoothed by means of a knife or sharp-edged trowel. The moulds can only be removed when the cement has hardened sufficiently. The briquettes shall then be placed in a damp chamber (zinc lined) furnished with a lid (also zinc lined) to prevent the irregular drying of the briquettes under varying degrees of temperature. After a period of 24 hours the briquettes shall be laid in water and kept completely submerged during the whole period of hardening. The proportion of water used shall be stated in the report.

(2) Sand and Cemnet. Five pieces of blotting paper soaked in water shall be laid upon a metal or glass plate, and upon each piece of paper there shall be placed a mould, also moistened with water. The cement and sand in their specified proportions shall then be thoroughly mixed together, after which the water shall be added, and the whole thoroughly worked for five minutes. With the mortar thus obtained each should be filled by one application so as to rise in a convex form above the edge of the mould. With an iron trowel the mortar shall then be patted, beginning from the side, first gently, then harder, until it becomes elastic and water appears upon the surface. No additional material must be added, as the briquettes must show a uniform density throughout. Superfluous mortar shall then be taken off by means of a knife or sharp-edged trowel, and the surface smoothed.

The moulds shall then be carefully removed and the briquettes laid in a damp chamber (zinc lined), furnished with a lid (also zinc lined) to prevent irregular drying. After a period of 24 hours the briquettes shall be laid in water and shall be kept completely submerged during the whole period of hardening.

(b) MACHINE-MADE.

(1) If possible, briquettes prepared as above shall be subjected to a uniform specified pressure (say, for example, 20 lbs. per square inch) by means of a ram of the same gauge as the moulds, or,

(2) A Bohme apparatus may be used. In this case, the moulds shall be filled with about 4-10ths of a lb. of mortar, prepared as in (a), and shall be placed in the machine; 150 strokes shall then be applied to the core with a hammer of about 4.4 lbs. in weight (2 kilog). After removing the mould and the core the briquettes shall be smoothed off, taken off the subjacent plate and treated as in (a).

By care in following the instructions given in (a) and (b) it will be found that hand work and machine work will give fairly uniform results. Doubtful cases, however, should be invariably decided by machine-made briquettes.

(8) TESTING MACHINES.

Testing machines shall be of the positive lever automatic type, so arranged as to apply the loads quietly and uniformly at the rate of 200 lbs. per minute.

(9) CLIPS.

The style of clips shall be such as will break the briquette at the line of least section. Clips with adjustable rubber or paper composition rollers are found to work satisfactorily and should be used.

(10) CHEMICAL TESTS.

Chemical tests and full quantitative analyses are strongly recommended; and preference will be given to cements of which analyses are furnished by the manufacturers.

(11) ADULTERATIONS, ETC.

Any cement containing adulteration shall not be accepted as a Portland cement. There are also certain ingredients which should be strictly limited in their amount. If there is found to be more than 2 per cent of sulphuric acid or 3 per cent of magnesia, the cement should be rejected. It is understood that Portland cements only are being specified for. The silica or sand cements are in a class by themselves, need special specifications, and are not intended to be included in the present one.

(12) PACKING.

Cement shall either be packed in paper-lined, air-tight barrels, well constructed and hooped so that, under ordinary conditions of handling, no cement shall sift out, or if in sacks, the texture of the sacks shall be so strong and fine as not to permit of any sifting out or wasting of cement under ordinary conditions of handling. The net amount of cement, deducting the weight of the package, shall be 350 lbs. per barrel.

(13) CERTIFICATE.

The manufacturer shall give a written certificate with each shipment of cement, stating (1) the date of manufacture, (2) the tests and analyses which have been obtained at the manufacturer's laboratory for cement taken from the day's grinding of which this shipment forms a part, (3) that the cement does not contain any adulteration.

RECOMMENDATIONS.

Frost Test on Cement. In case of experimental tests made for the purpose of determining the action of cements when exposed to severe frost, it is recommended that the cements be mixed at a temperature below freezing, with cold water, cold sand, and kept exposed to ordinary winter weather, just as they would be exposed in actual construction of masonry. A description of what is done in this connection should be kept for comparison with other results, and the records of such experiments filed with the secretary of the Canadian Society of Civil Engineers.

It has been observed in hot bath tests that little pustules or eruptions take place on the surface; instances are also given of the glass shattering in the hot bath test without separating from the cement or without any other sign of failure on the part of the cement. Members of the society are requested to observe the causes or reasons therefor and report the same to the secretary of the society.

Inasmuch as small consumers are rarely able to gauge or mix their test specimens with a mechanical mixer, it is advised that where tests are made by hand-mixing, due discrimination shall be made in comparing the results with tests made by mechanical mixing. Hand mixing done by an expert will probably agree closely with mechanical mixing, but for ordinary testing the mechanical method will give more uniform results, inasmuch as no skill or dexterity is required to produce approximate uniformity.

Cement testers, where possible, should make long time tests to see whether or not there is any connection between high early tests and future falling off in tensible strength, and whether, when mixed three to one with sand, the same or similar deterioration is observed. These tests should, if possible, be carried on for several years. It would be of the utmost value to the profession to obtain positive data on this point from engineers in charge of municipal university or other laboratories, who are in a position to supply it.

*Report of special committee submitted to Canadian Society of Civil Engineers, January, 1902.

The sudden death is recorded of Mr. Thomas Mowbray, a well known sculptor, of Toronto. Before coming to Canada the deceased executed carvings on some of the most important public buildings of Liverpool, Eng. The Toronto Custom House shows examples of his skill.

Mr. J. O. Marchand who for nine years past has been engaged in the study of Architecture at the Ecole des Beaux Arts in Paris, has returned to Montreal, his native city, and in conjunction with Mr. Stevens Haskell, of New York, has commenced the practice of his profession there. The firm have opened offices in the London and Lancashire Building, St. James Street.

BY THE WAY.

The announcement that a manufacturing company has leased until August first next, the Machinery Hall on the Industrial Exhibition grounds at Toronto, as a storage warehouse, paying therefor a rental of $300 per year and for extra insurance, suggests the enquiry: Why might not the other important exhibition buildings be thus utilized for ten months of every year and made to yield a revenue?

× × ×

"It is especially easy for a plumber to lose his reputation for good workmanship," said a prominent member of the Guild. "After you have as you suppose put in the very best materials and workmanship, the system has perhaps no sooner gone into use, than lo! a leak develops, due to a flaw in the tap, and straightway the plumber's work is condemned and his reputation with that particular customer at least has suffered, and through no fault of his own."

× × ×

The fall of the Campanile at Venice serves to confirm the old adage that declares: "It's an ill wind that blows nobody good!" The accident has created a general feeling of alarm regarding the safety of the other famous structures of the city. Investigation has apparently been started none too soon, for it is said that cracks and fissures have been discovered on every hand and the wonder is that the walls of some of the buildings have held together so long. During a recent service in the Church of St. John and St. Paul the capital of a small window column fell from its place and created a panic. The prospect before the builders of Venice is most encouraging.

⁂ × ×

In the Middle Ages many of the principal buildings, devoted to religious uses, were designed by monks. Interest in architecture by the clergy of the Roman church continues to the present, but as a rule the designing of their buildings is entrusted to architects in regular practice. It appears, however, by an announcement in the press that the Rev. Father J. Bouillion, Canon of the Roman Catholic Cathedral at Ottawa, Ont., has prepared and had approved by a religious community in New York plans for a church edifice of colossal proportions, to be called the Nova Sancta Sophia. Accommodation has been provided for 60,000 or 70,000 persons. The structure is to be surmounted by a dome 420 feet above the ground, while the interior is to be enriched with columns of rare marbles and costly mosaics.

PATENT STORE FRONTS.

One of the new inventions, covered by half-a-dozen patents in the U.S. and Canada is the Coulson Corner Posts and Transon Bars. This is of great importance to all architects and builders, and a large number have already been ordered for different points in Canada. The great feature of this invention is that plate glass can be put in from the outside. It has the advantages of least obstruction to light, greatest strength for holding large windows safely, and least danger and trouble in setting or replacing large plate glass.

Instead of a heavy wood frame, "The Coulson" is made of a narrow light piece of soft wood set into a groove, in the back of which the angle of a steel T-bar is sunk and firmly fastened by lag screws. The glass being set and firmly secured by wooden stops the advantage of an all-wood bearing for the heavy plates is secured with the rigidity of the iron T-bar added. The face of the posts and bars, together with the wood stops which make up the outside may be covered with polished brass, sheet aluminum, oxidized nickle plate or copper sheeting, firmly screwed to the wood after the glass is set, presenting a beautifully neat and light appearance of a single metal or wood strip between the several plates of the window.

For artistic windows, for economical and effective displays or advertising this new invention is especially useful and we predict a large sale throughout Canada.

The Metropolitan Plate Glass Insurance Co. of N. Y. made a thorough investigation of the Coulson and they have highly commended its use to all architects and builders. They also stated that the invention was the very best to lessen losses occasioned by handling plate glass.

A visit to the works of the Coulson Co. show a busy section of the city of Columbus, Ohio. They will be pleased to send their illustrated book to all applicants.

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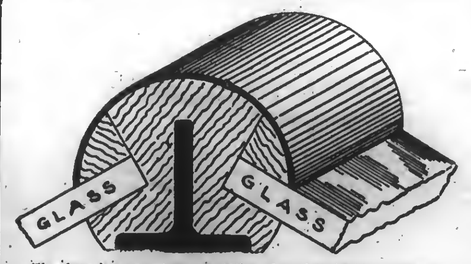

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THE MERCHANTS' BANK OF CANADA, WINNIPEG.

The extraordinary progress made by this energetic western city prompted the Merchants' Bank to be in the very van of business, and with the fullest faith in the permanence of this progressive movement, decided to erect a substantial 8-storey fire-proof bank and office building, on a splendid site at the corner of Main and Lombard streets.

The designing of this important work was entrusted to Mr. Andrew T. Taylor, F.R.I.B.A., architect, of Montreal, who has designed many bank buildings throughout the Dominion. Most of the ground floor is occupied by the bank, and the other floors are all laid out as offices. The subsoil in Winnipeg is a somewhat soft clay, and as this is probably the heaviest building for its area that has been erected there, special precautions had to be taken with the foundations.

The ground storey is of fine cranelled creamy white Indiana limestone on a plinth of granite; above that the storeys are of a fine toned red pressed brick from St. Paul, with a great deal of stone dressings, and surmounted by a very elaborate and handsome ornamental copper cornice.

The banking room is handsomely finished in antique oak and marble, and has an ornate and rich elliptical arched ceiling. The floor is of ornamental mosaic, and the large windows afford magnificent light. The vaults are strongly and elaborately built, and nothing has been spared to make the building complete in every respect. Two electric elevators supplied by The Fensom Elevator Co. of Toronto, give rapid service to the offices. The elevator enclosures are of very handsome ornamental design, being of specially designed wrot. metal and finished in antique brass.

The staircase is of iron and marble. The entrance is lined with rich marbles. The staircase goes up to the roof, and as this is the highest building in Winnipeg, a very extended view is obtained of the city and surrounding country. The offices are finely finished in hardwood, with plate glass windows and hardwood floors.

The general contractors were Messrs. Black & Co., of Winnipeg. The bank fittings were executed by the Canadian Office & School Furniture Co., of Preston, from designs by the architect. Mr. Frank Peters, of Winnipeg, and Mr. Robert Wilson, have very efficiently superintended the work.

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A Russian nobleman is said to have built of paper a house of 16 rooms upon his estate at Savinowka, in Podolia. This house was made in New York, at a cost of 80,000 roubles, and its architect declares that it will outlast a stone building, which is quite creditable when one reflects upon the rapidity with which some of our stonework is disintegrating from the action of rain, frost and heat. Bergen, in Norway, has a church built of paper, capable of seating a thousand people.

Owing to its remarkable hardness, elasticity and durability, it rivals the best wax finish, but is free from its unpleasant slipperiness.

Moving furniture or boot heels do not leave white marks, nor does soap, mud, or water destroy its fine appearance.

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Architects patronize home industry and specify Granitine Floor Finish.

SHOP ON MAIN STREET, WINNIPEG, MAN.
SKETCHED BY PERCY OVER

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
NOVEMBER, 1902

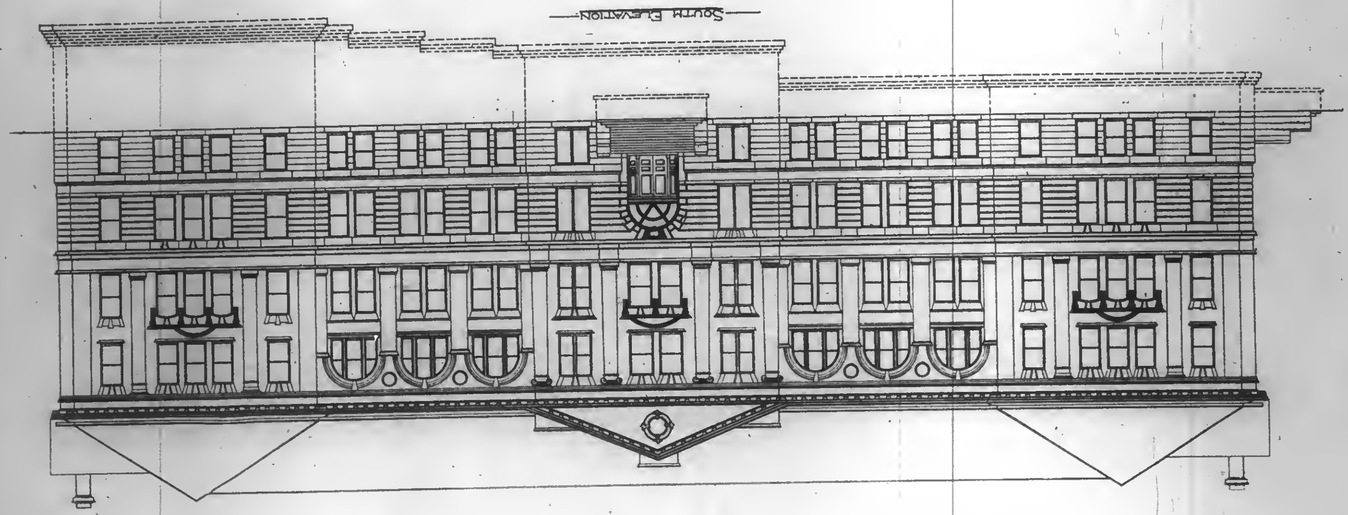
St. John's Church, Toronto.
Eden Smith, Architect.

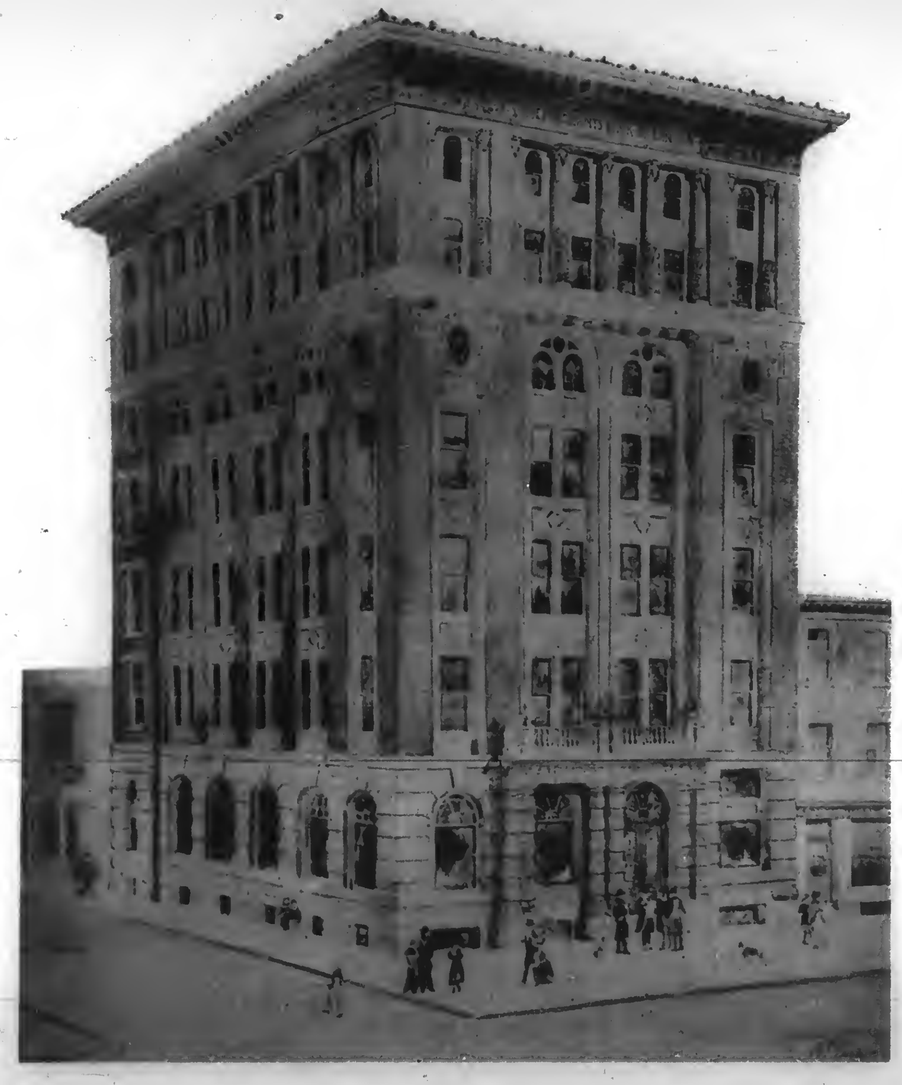
Two Houses, Toronto, Ont.
Eden Smith, Architect.

Branch of the Dominion Bank, Bathurst and Bloor Streets, Toronto.
Eden Smith, Architect.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
NOVEMBER, 1902

NEW CHEMISTRY AND MINING BUILDING, SCHOOL OF PRACTICAL SCIENCE, TORONTO.





MERCHANTS' BANK, WINNIPEG, MAN.

A. T. TAYLOR, F.R.I.B.A., ARCHITECT.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
NOVEMBER, 1902

London and Globe Insurance Building, Montreal.

Hutchison & Wood, Architects.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
NOVEMBER, 1902

The Canadian Architect and Builder

VOL. XV.—No. 180. DECEMBER, 1902.

ILLUSTRATIONS ON SHEETS.

House in Rosedale, Toronto.—Beaumont Jarvis, Architect.
The William Davies Building, Toronto.—Burke & Howard, Architects.

ILLUSTRATIONS IN TEXT.

Buildings under construction for the Louisiana Purchase Exposition, at St. Louis, Mo.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Photogravure Plate—Chapel in Ancient Cemetery of Arles, called Alescamps (Elissii Campe) by which it was known 18 centuries ago. Dante mentions it in the "Inferno," and Ariosto alludes to it in the Orlando Furoso.
Photogravure Plate—La Rue de la Grosse Dorloge, Rouen, built 1527.
Summer Residence at Beaconsfield, Que.—Andrew T. Taylor, F.R.I.B.A., Architect.
Bank of Nova Scotia, Toronto.—Darling & Pearson, Architects.

CONTENTS

Editorial	141-142	Bank of Nova Scotia, Toronto	146
Office Management	143	Photography as Applied to Architectural Measurement and Surveying	147
Originality of Design in Architecture at the Expense of Beauty (Slater)—How Sky Scrapers can be made more Aesthetic	144	By the Way	149
Province of Quebec Association of Architects	145	C. A. & B. Students' Competition	149
The Purpose of Sculpture	145	Building Stone of Nova Scotia	150
Competitions	145	The Electric Elevator	151
Tests of Cement Mortar	146	Plasterers' Grievances	ix
Educational Course for Architectural Students	146	Architecture of Toronto	x-xi
Summer Residence, Beaconsfield	146	Ontario Association of Architects	xii
		Experiments with Fireproofed Wood	xiii

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To our readers every one we wish a Joyous Christmas and a Happy and Prosperous New Year.

Students' Competition.

Attention is directed to our Students' Competition for a Suburban or Town House, to cost $2,500. Particulars of this competition were printed in our November issue and again appear in the present number. It is hoped that architects throughout the Dominion will call the attention of their students to this competition and urge them to enter. An opportunity is afforded every student to test his powers and to learn where he stands in the ranks of the coming generation of Canadian architects.

Architects' Assistants.

The supply of competent men in this line is at present much below the demand. A few years ago hundreds of draughtsmen were looking for positions. To-day all whose services are worth having are steadily employed at good salaries. There are a few floating about looking for employment, but they are the kind that no architect of standing would wish to have in his office. They either lack a proper understanding of the work that a draughtsman is expected to perform, or are so careless in their methods that they cannot be relied upon. A man belonging to this class on being sent to take measurements of some old buildings to which additions were to be made, was found to be out more than two feet in his figures showing the width of the building, which had a frontage of only 70 feet. Inaccuracies scarcely less glaring marked his other measusements, so that it became necessary to do the work over again. Such "ass'stants" are simply a stumbling block and a source of annoyance to architects.

Close Planning.

In these times of high prices for labor and material, the architect who desires to save his clients' money will give the most careful attention to the preparation of his plans with the view of securing the necessary accommodation within the least possible area. This is especially necessary in house planning, owing to the more costly interior finishings. In this class of work every additional two feet of area will add about six per cent. to the total cost of the structure. The necessity for the closest planning is therefore apparent. As regards the cost of building, there is nothing to indicate cheaper prices. On the contrary, there seems a probability that they may go still higher. Brickmakers have been unable to obtain fuel, and the kilns in the vicinity of Toronto are said to contain millions of unburned stock, which will not be available this year. This will probably mean an advance in prices next spring. The demand for iron and steel has been so great that the output of the mills for a year to come is said to be already contracted for. These facts would seem to prove th

co tinuance of the present era of high prices for at least a year to come.

Canada's Development.

CANADA has entered on a period of development which seems likely to rival that of the United States. Almost every day brings news of some colossal enterprise, and we are becoming so accustomed to such announcements that as a rule we receive them with but very moderate surprise. The declaration however by the authorities of the Grand Trunk Railway Company of their purpose to begin immediately the construction of a line by way of the Peace River Valley to the Pacific Coast, has naturally awakened the deepest interest from one end of the country to the other. The announcement is a declaration of confidence in the future of our great northwest territory that must greatly redound to the benefit of this country. The expenditure of something like $100,000,000 in the construction of the new transcontinental line will help to extend and maintain for some time to come the prosperous conditions now prevailing, while the inflow of population following the opening up of a vast and fertile territory, will permanently broaden the market for manufactured products. The future greatness of Canada seems now to be assured and considering the rapid movement of events in these days, another decade will probably witness its realization.

Is Your Wiring Safe?

THERE have been a great many fires lately in Canadian cities whose origin has never been satisfactorily determined and which have consequently been blamed on that force, to the layman so mysterious and uncontrollable, which is called electricity. The popular verdict may be right, or it may be wrong, but the fact remains that a large proportion of the electrical installations in this country, more especially the older ones, are in a state so dangerous that it is simply amazing. As instances, may be cited a warehouse which, devoid of attendants 90 per cent. of the week, and filled with cotton and woollen millstock, was wired without an entrance switch and equipped with the ordinary link fuses, absolutely open. The chances of a melting fuse igniting the bales not over eight feet away and directly below them were so great as to amount almost to a certainty; in fact the woodwork bears evidence of one fire which has already occurred and which was due, so we are informed, to electrical causes. Another case is a church in which the wiring, ramifying all over and through the building, mostly wood, and minus any attempt at bushing either with porcelain or even rubber at the many points where it passes through walls and floors, is supported by wooden cleats in its many wanderings past gas, water and furnace pipes of all descriptions. Investigation would probably show many such installations as these; is it any wonder that fires occur in them? Rather is it not a source of surprise that so few fires occur, especially when we consider the many chances that exist for line crosses, transformer breakdowns and lightning discharges bringing into the building potentials which are not only much greater than can be controlled by the insulation of the circuits, but which in addition are dangerous to life. A stitch in time saves nine; if you are a consumer why not spend the comparatively small amount necessary to put your wiring in good shape, at any rate have it periodically inspected; if you are a producer look carefully to your own lines, especially those in the station itself, in addition urging upon your customers the necessity of keeping careful track of the electrical material, both new and old, both machinery and wiring, which they may from time to time have upon their premises. If these precautions are taken, the public will gradually become less skeptical of electricity as a fire hazard. There is no reasonable man who does not acknowledge that electrical illumination and electrical power, compared for instance with oil and gas, are not only the most artistic and convenient, but far and away the safest, it therefore behooves us all to see that as far as in us lies, due precautions are taken in the installation of this method of illumination.

Government Architecture.

THERE is a marked contrast between the architecture of government buildings in the United States and in Canada. The designs for public buildings prepared in the office of Mr. J. Knox Taylor, Supervising Architect, at Washington, rank among the very best examples of modern work done in the States. Evidently Mr. Taylor is himself a master of his profession, and has under his direction a staff competent to give effect to his ideas. We regret to say that in Canada the opposite conditions seem to prevail. Many of our government buildings erected in recent years are atrocities in design—the work in some instances of engineers—or stupidly commonplace and uninteresting. The latest example is the new chemistry building for the School of Practical Science, Toronto, the principal elevation of which was published in the illustration pages of our November number—rather an example of what to avoid than of what to follow. The design for this building is entirely unworthy of the splendid site which it will occupy. Besides showing an entire disregard of harmony of style, the design is in other respects lamentably weak, and perfectly lacking in interest. To particularize but briefly, we need only direct attention to the diminutive pediment in the center of the facade dominated on either side by larger ones, and to the character of the window openings in the upper stories. Realizing the importance of the building and the site, the Ontario Association of Architects urged the government to institute a limited competition for designs among leading architects in private private practice. This suggestion having been declined, the privilege was then requested of examining the designs to be prepared in the Department of Public Works, and of making any suggestions for their improvement that might seem desirable. While this request was not refused, no definite information was vouchsafed as to when the plans would be ready, nor was a proper opportunity given for their examination a protest of the Toronto Architectural Eighteen Club was likewise disregarded. It was apparent that no outside suggestions or interference was desired. The result is before us, and is such as to confirm the rumor that this department of the Government service is run on political lines, and affords a shelter for incompetents and "has-beens." It is time for a change which will secure beauty as well as utility in our public buildings.

GARGOYLE, CREWKERNE, SOMERSET.

OFFICE MANAGEMENT.

A series of excellent articles, on the business side of an architect's office, which have been coming out during the current year in the Brickbuilder, are worth reviewing and condensing for the use of architects in this country.

Method is essential, even in a small practice, and the different heads under which office method is here outlined must have place in some form in every office, if work is to go smoothly. It is better, as the author of the articles in the Brickbuilder says, to adopt, at the beginning of a small business, a comprehensive scheme which may be expanded, so as to avoid making revolutionary changes at a later date.

FILING is the first thing to be considered; to keep the letters, drawings and other documents, so that they may be surely and easily produced for use. The great thing is to keep everything that relates to any given building in receptacles devoted exclusively to that building, all marked with its mark. The most convenient mark is a number; the number which that commission bears in the office history. This marks the position of all files of this building in the set of files of their kind. The number serves for both file number for orderly arrangement and as a means of indentification for every kind of document relating to the particular piece of work so numbered.

In connection with the file system two card catalogues are necessary. One is an index of addresses and the other of drawings. In the address catalogue tray every name connected with the office work or correspondence is inserted in alphabetical order and the card bears, below the name, the nature of this connection. Thus, John Smith who has below his and address—

"13—Residence on St. George St."

19—Stable on Huron St."

is a client for whom were done works 13 and 19. John Smith who has below his name and address—

"13—Plumbing and Heating,"

was the contractor for those works in the residence of the other Mr. Smith on St. George St. If there is another John Smith who has done nothing but introduce a friend, his letter and reply will be found in the miscellaneous letter file.

If then Mr. John Smith the owner writes about something on the second floor of his residence on St. George St., anybody in the office can find the drawing or any document relating to the question, by looking up Mr. Smith in the address tray and getting file 13 of the kind of document required. If it is a drawing he may refer first to the drawing catalogue. Here the raised guide card, marking off the other cards relating to this building, is marked "13 John Smith, Residence", and is of course in its numerical order in the tray. All necessary information about John Smith and his building may be written on this card against printed headings of location, description (brick, frame, etc.) total cost, cubical contents, cost per cub. ft., date of first contract, date of last certificate. After this may come a card, if the building is of any size, giving the scheme of numbering for the drawings. Thus, preliminary sketches may have a letter prefixed to them; if there is more than one series of these sketches they will be marked A, B, etc., before the drawing number. Then, when the design is settled, the working drawings may be subdivided, on the same plan that rooms are numbered in large buildings, so that the number itself indicates where to look for it, thus:—general drawings, 1-99, iron 100-199. plumbing, heating, electric light, etc., 200-299, scale details 300-399, full size details 400-499, etc. This being done each card may be filled with numbers—five on each side would make a convenient progression for turning over rapidly, as each card will count ten. The five numbered spaces on each side should be ruled off from one another and have also spaces left to enter the dates of beginning and approval of the drawing, the scale and the draughtsman. Here, as in all other forms, everything that is fixed should be printed; not only to save labour but as a perpetual reminder of what must be recorded.

LETTERS.—The modern practice is not to copy letters in a letter book, but to typewrite them in duplicate and file letter and answer together. With the increased use of stenographers and typewriters, correspondence may be made and should be made a complete record of business. Every time the owner gives instructions he should receive a letter accepting the instructions; every time a warning, or instruction, or order is given to a contractor a letter ought to record it.

DRAWINGS.—The stamp for drawings should have spaces headed as recording the initials of the maker, tracer and reviser, the date of the drawing, its building number, drawing number and issue numbers, besides a space to letter its descriptive title and scale. The architect's name and address will of course be part of the stamp. The essentials for filing, and for record in the issue book, are the numbers.

Drawings must be kept flat. It has been customary to do this by keeping them in portfolios and this has advantages for facility of handling folded drawings; but hanging appears to be the modern way, and it is certainly better for frequent handling. The drawings are clipped in files after the manner of newspapers and can be hung very close together, end on to the back of the closet. A closet a little more than 3 feet or 3 feet 6 inches deep is necessary and all drawings must be made or folded to hang from a file of this length. Hanging in this way, according to building numbers, and drawing numbers, drawings are easily found and used. Full sizes larger than the standard size of the file should be drawn on paper which is a multiple of that size, so that they will fold to match the other drawings. Bond paper 27" x 40" with a blank title printed in one corner, is in use for full size details, in the office of Messrs. Cope & Stewardson. These sheets are said to give good prints from lead pencil lines. Most details can be got upon paper of this size, and others can be folded to the same size. It is a great help to draw some details not only full size but at full length, but a drawing of this kind is intended

only to help the designer : it is a study, and is better condensed afterwards in small form for the working drawing, which needs nothing but the details, and which has to be handled and copied and filed.

BLUE PRINTS.—The articles in the Brickbuilder do not take notice of blue printing in the architect's office. There are blue printing establishments to which the work is sent out, and which render monthly accounts based on a charge per square foot. Orders are sent out by means of an order book made of alternate yellow and thin white leaves. By means of carbon paper and lead pencil the order is written in duplicate. The perforated yellow leaf is sent out with the drawing and the white book-leaf remains, to be used in checking the monthly account. Both yellow and white leaves are ruled and printed in the same form with headings under which to note the essential points, viz., the order number and date, the building number, the sheet number, the number of copies required, the kind of print (blue, black, etc.), the material (paper or cloth) and the size—first in the dimensions required and again decimally in square feet. This last column, when totalled on all the order slips of the month, gives immediately the means of checking the amount of the monthly bill.

ISSUE AND RECEIPT OF DRAWINGS.—A book should be always at the office boy's hand, ruled for record of drawings sent out. The headings of the rulings would be the issue number, the building number, the drawing number, title and description (tracing, print, etc.), the purpose of the issue, the issuer and the dates of issue and return. Receipt forms should be sent with the drawings, and if a receipt is not returned another form should be sent out. The guide in this case is the issue number. The entries in the book and the receipts filed are in the order of the issue number, and this number should be marked on a drawing when it is sent out. Every time it is sent out it will receive a new issue number. When the drawing is brought back the issue number points to the place where credit should be given, and the date of return is entered instantly. To find out where a given name or a given drawing are in the list, in answer to an enquiry whether certain contractors have received a drawing or where a certain drawing is, it is necessary to run the eye down the list of names or drawing numbers. This is said to be rapid enough.

W. A. LANGTON.

ORIGINALITY OF DESIGN IN ARCHITECTURE AT THE EXPENSE OF BEAUTY (SLATER)—HOW SKY-SCRAPERS CAN BE MADE MORE AESTHETIC.

Editor CANADIAN ARCHITECT AND BUILDER:

SIR,—Under "Notes" in your last issue, page 135, you cite Slater, vice-president R.I.B.A., as saying that "there is too great a tendency nowadays to mere eccentricity or originality amoog the younger architects, while beauty of design or aestheticism is neglected."

There is abundant truth in this, as witness many of the designs for even pretentious dwelling houses, which would be more appropriate as club houses at fishing and sporting stations in our forest reserves.

In your "C A. & B. Students' Competition" at page 130, for the design of a dwelling house on a 50 foot lot, you very properly advise students that the adjoining buildings are within 10 feet of their respective boundaries, thereby leading them to infer that the proposed building should also fall short in its dimensions of the whole frontage of the lot to be built upon. This is most essential in certain cases, for light and air on all sides, and more especially where costly structures to show to advantage must be kept away or isolated from adjoining buildings, except of course along the business streets of a city where land is expensive and every foot of it has to be made available.

If Mr. Slater would, when he visits Quebec, take a walk along our "Grand Allee" or St. Louis road, he would, while deprecating eccentricity of design in a certain house with a most fortress-like basement, deplore the vicinity of such a costly structure to those on either side of it. In fact it so abuts on or against the gable end of the house adjoining it to the eastward that one cannot tell whether the more salient and ornamental turrets and chimney stacks of the former belong to it or to the latter; it is only when looking at it directly from the street that one can tell which is which.

Now, sir, this is a pretentious building in every respect, said to have cost some $37,000, and it is really a pity that the architect, a Montreal man, did not advise his wealthy patron to purchase a wider lot for such a splendid structure, original though it be in design.

With regard to tall buildings of the sky-scraper persuasion, it is singular how in course of time one can become wedded to such a style of architecture when treated in a way to produce the impression that the building is made up of a lesser number of horizontal sections. Your engraving of the facade of the London Globe Insurance Building, of Montreal, is proof of a good attempt at this, where the two lower floors or stories of the building are so to say combined in a way to look like but one by separating them by a salient cornice from the stories above, and the attic or eighth floor is apparently eliminated by being separated from the floors below by a heavy eave cornice, which I believe it would have been preferable to bring down another story, and thus reduce the intervening five stories to four, while leaving two above the main entablature to form the attic portion of the edifice.

Your engraving also of the splendid new bank for Winnipeg would imply that had the two lower stories been made one of, apparently, which impression would have been given by separating those two floors from the remainder of the edifice by some salient horizontal feature such as a continuous balcony or ornamental bracket, and by making far more salient the cornice between the upper story and the one below it, or even, as in the case above alluded to, by bringing down this cornice in a way to leave two stories above it for an attic; then would also this facade have acquired something of the classical features looked for in building in geoeral where some proportion is looked for between the three horizontal sections of an edifice—it's base or pedestal, it's shaft or main section, and it's capital, entablature or attic.

It must be admitted that where a tall and narrow building, such as there are so many of in New York and Chicago, one absolutely unrelieved in any way by separating horizontal salient features, the thing we look upon is far from being one of beauty; but when, as in the New York Waldorf-Astoria, there is, coupled with great height, a corresponding breadth of base, with a combining of the stories together in threes or fives and even sevens, there may still result a species of aestheticism, which when taken with the absolute necessity in our time for such multi-floored or storied structures render the building less distasteful.

A pertinent example of this is now being given on Broadway, New York, between 73rd and 74th street, where the new Ansonia Department Hotel, so called, which is about 200 feet square, is to be seen, or soon will be, with its 16 story facade broken up into three sections, of which the basement combines the three first floors of the building, the attic or upper portion the two or three upper flats, and the main shaft or middle section, thus reduced to only 8 or 9 stories and in a way, as above inferred, to cause it's facades, thus divided by salient balconies, to become really acceptable from an aesthetic point of view.

CHAS. BAILLAIRGE,
Architect and Engineer.

Quebec, Que.

The Queen City Plate Glass & Mirror Co., Ltd., have made extensive additions to their already large plant.

The Brick Manufacturers of Ontario have organized an Association with the following officers:—president, B. E. Bechtell, Waterloo; vice-president, Robt. J. McCormick, Warwick; secretary, Alex. Johnston, London; treasurer, Henry Janes, Delaware; executive committee, Messrs. J.W. Cawrse, London, and John Karn, Brownsville.

PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS.

A series of monthly meetings for the informal discussion of matters of interest to the profession have been arranged in Montreal. The meetings are held on the third Tuesday of each month. There have already been held two meetings. At the first one held in October an informal discussion took place on "Professional Esprit de Corps"; the second held in November consisted of a small dinner and a lecture by Mr. F. G. Archibald on "Legal Responsibilities of the Profession." The lecture which was given with a resume in French by the lecturer, was followed by a discussion on the same subject by the members present. The meetings were very satisfactory as to attendance and interest shown by members. The next meeting which will take place on the third Tuesday in December, will have a specially artistic character. The Council propose to invite to this meeting other artists, sculptors and painters, and there will probably be a conversation on the special features of what is called the "Art Nouveau." At future meetings there will probably be one or two other lectures on legal matters by Mr. Archibald; conversations and perhaps lectures on technical education and other topics of interest to the art and profession are also contemplated, the intention being to make such enterments as broad and varied as possible so as to meet the ideals of all members, whether artists, business men or specialists.

THE PURPOSE OF SCULPTURE.

In a lecture on this subject delivered recently at Cambridge, England, Mr. Alfred Gilbert, R. A., observed that the art of sculpture had many and varied sides, and the more he worked the more he tried to find out which was the right and proper road to perfection. Sculpture was not merely a doing, a making, or the mere expression of a man's idea. It was threefold in its purpose. It was mechanical, to begin with; it was real, to go on with: and it should be—and must be, if it was to carry any message forward—ideal. The work of a sculptor was not merely the work of one who hewed and broke and tried to make. His efforts should be moulded by that something called love, veneration, faith—that love which impelled him to give up everything, to do everything in his power to educate and lead his fellow beings to that extraordinary refinement and delicate perception of the beautiful which alone could be understood by those who love. Pygmalion so loved the image his own brain had created that he longed that the great creation could speak. The sculptor's great object was that his creation should speak—without the aid of an exhibition catalogue. The work of the artist should be the work not only of his art, but of his heart. The function of sculpture was not merely the making of an object. The primary object was to make something beautiful, something that whoever saw it should be elevated by it, something that was not the mere imitation of an everyday person. The more he thought the more was he astonished that the practice and the teaching and the encouragement of the art was so little thought of. The equipment of the sculptor was not sufficiently given in our art schools. The sculptor should be as well equipped as the mathematician, the poet or the architect, by education. He wanted to connect the practice of sculpture with the practice of general education. Until they did tha he was convinced that they would never hope to take rank as artists with the great men among the Greeks, whose excellence was the outcome not only of pure mechanical training and skill, but the influence of great mental power. The artist must read and think, and the more he thought the better artist he was likely to be. He had been twenty-five years in finding out that he knew nothing about the making of a statue. He was only just beginning to know how to approach the exposition of the art, which was to make everything he touched as beautiful as his own unbeautiful nature would allow him to do.

COMPETITIONS.

A competition is announced for designs for a church to be erected in the city of Patras, in Greece, to cost $250,000. The committee having the matter in charge consists of the Metropolitan bishop, the governor of Achaia, and the Mayor of Patras. The conditions of the competition which is understood to be open to the world, are as follows :—

1. The dimensions are left to the discretion of the architect, but must come within a ground space of 2,400 square meters (25,834 square feet).

2. In planning this structure, consideration must be given to possible effects of earthquakes, to which this region is subject.

3. The edifice must accommodate at least 5,000 worshippers, not including standing room in the women's apartments or other annexes.

Possible models of architecture might be found in the Russian Church of St. Nicodemus, in Athens, or in the church of St. Sophia, in Constantinople.

The contest will be divided into two parts; all who pass the first degree will be entitled to enter the second degree, and no others. The general requirements for the first degree are as follows:

1. To submit a general view of the temple and courts on a scale of 1 to 500.

2. View of front of temple : scale, 1 to 200.

3. Two views, front and lateral ; scale, 1 to 200.

4. View cross section, setting forth the general plan, according to the judgment of the artist.

5. Estimate of the cost.

6. An abridged technical memorandum.

The plans submitted will be passed upon by the committee, and the successful architects will be required to meet some additional conditions, among which are the following :

1. View of temple ; scale, 1 to 100.

2. Three views—front, lateral, and rear ; scale, 1 to 100.

3. Diagram showing the principal architectural features : scale, 1 to 100.

4. Two cross sections, with internal views ; scale, 1 to 100.

5. Cross section, showing manner of heating, ventilating, etc.

The contest of the first degree closes at 12 o'clock noon of February 13, 1903. All who have successfully passed into the second degree will be given one hundred and fifty days additional from the time the decision is rendered. The final plans will be submitted to some academy of the fine arts in Europe, and in accordance with its decisions the committee will award a first prize of 10,000 francs ($2,000) ; a second, of 4,000 francs ($800) ; and a third, of 2,000 francs ($400).

TESTS OF CEMENT MORTAR.

The results of a series of tests of cement in connection with the construction of the Wachusett dam are summarized in the report of 1901 of the chief engineer, Mr. F. P. Stearns, who also gives the following notes concerning some special investigations:

In view of the very large amount of mortar to be used in the dam and the importance of having it as water-tight and strong as possible, extensive experiments were begun early in 1901, to determine the permeability and strength of mortars made of the natural and Portland cements which were to be used in the construction of the dam, mixed with different proportions of coarse and fine sands.

The experiments on permeability were made by placing the cast-iron cylinders, 22 inches long and about 6 inches in diameter. After the mortar had set, caps were bolted to the tops of the cylinders and water was admitted to the cylinders between the caps and the mortar with a pressure of 74 pounds to the square inch. There were 144 cylinders used in the experiments, and the apparatus was so arranged that the water pressure could be applied to 24 cylinders at a time. The applied water was first filtered through sand, to remove all suspended matter.

There were 1,494 briquettes made and broken, to determine the tensile strength of the mortars. It was found that the use of a sand with a very large proportion of coarse particles and a much smaller percentage of the finer grades makes a mortar both less permeable and stronger than where a larger proportion of the finer grades is used, provided the proportion of sand to cement does not exceed 3 to 1.

In addition to the experiments upon permeability and strength of mortars other experiments were made to determiue the relative strength of mortars used immediately after wetting and mixing and when used at different intervals up to two hours after they are first wet and mixed. These experiments were very extended, as they were made with mortar mixed with different grades of sand, with Portland and natural cement, with slow-setting and quick-setting cement, and with mortar that was worked continuously from the time of mixing until it was put into the molds and also with mortar which was not worked after it was mixed until just before it was put into the molds. The briquettes were broken at the end of fourteen days, twenty-eight days and three months after mixing.

It was found that when the cement, both Portland and natural, were so manufactured as to take the initial set slowly, the strength of the mortar was not diminished by a delay of two hours in putting it into the molds; and when the mortar was worked continuously to the time of filling the molds, there was an increase in strength occasioned by the delay. When the cements were so manufactured as to take the initial set quickly, the results obtained with the quick-setting Portland cement were not materially different from those obtained with the slow-setting cement, except that when the mortar was not worked there was a slight loss of strength in the briquettes molded at the end of one and a half and two hours, and at no time was there much gain of strength occasioned by delay in filling the molds. The results obtained with the quick-setting natural cement were less favorable, as the briquettes broken at the end of fourteen days showed a great loss of strength when there was much delay in molding the briquettes. At the end of three months, however, the briquettes made with mortar which had been worked continuously from the time of mixing showed slightly greater strength than that put into the molds immediately, and the loss of strength of the mortar not worked was not very marked except for the 1½ and 2 hour periods.

EDUCATIONAL COURSE FOR ARCHITECTURAL STUDENTS.

An educational course for architectural students in Toronto has been arranged by a joint committee of the Toronto Chapter of the Ontario Association of Architects, and the Toronto Architectural Eighteen Club. The fee for is $5.

The course will consist of scientific classes held at the rooms of the O. A. A., 96 King Street, West, and the studio work now carried on at the Central Ontario School of Art and Design.

The scientific class will be held on Thursday evenings, the studio classes on Monday, Wednesday and Friday evenings.

It is strongly urged that all architectural students in the city attend both classes.

SUMMER RESIDENCE, BEACONSFIELD.

This residence for Senator Drummond, an illustration of which appears in this number, has recently been completed adjoining his well-known stock farm and golf grounds, and overlooks Lake St. Louis. Its wide, cool galleries and portico and its great hall, over 40 ft. long, are special features. It is an adaptation of the old Colonial and Georgian style, and is very substantially built of wood on a stone substructure. It is finished in white and primrose and the roof is stained moss green.

The interior is elaborate, and is finished in white enamel, and the walls hung with bright charming Morris papers. The fireplaces and mantels are a feature, and are numerous and large.

The tower was specially designed for an extensive view over Lake St. Louis and the surrounding country.

The work has been carried out very satisfactorily by Mr. John Allan, contractor, from the designs and under the superintendence of Mr. Andrew T. Taylor, F.R.I.B.A., architect, of Montreal.

BANK OF NOVA SCOTIA, TORONTO.

This building, the principal facade of which is shown in the illustration pages of this number, is in course of construction at Nos. 37 and 39 King Street West, Toronto. The front is to be of gray sandstone, the main wall being recessed a distance of ten feet from the street line. The dimensions of the banking room are 85x32 feet; height, 35 feet. This room will be decorated in the Free Classic style which characterizes the building. The scheme of lighting is from the sky. The walls to the height of fourteen feet are to be lined with second statuary marble. Above, a range of Ionic pilasters will divide the wall surface into panels, available for mural painting or other decoration. These pilasters are surmounted with a rich architrave, frieze and cornice. The length of the room is divided into three bays, and the panels offer space for a variety of treatment.

The space reserved for the public is to be laid with mosaic tiled flooring, and the counters will be of marble in contrasted colors, surmounted by handsome bronze grills. The whole of the desks and office fittings are to be of sheet steel, entirely eliminating wood from the structural part of the building and rendering the structure as far as possible fireproof. Messrs. Darling & Pearson, of Toronto, are the architects.

PHOTOGRAPHY AS APPLIED TO ARCHITECTURAL MEASUREMENT AND SURVEYING.*

By J. Bridges Lee, M.A.

Most people are in the habit of looking upon photographs as more or less artistic or inartistic pictures destined to convey impressions more or less accurate or inaccurate of what things look like. Comparatively few people have yet acquired a habit of regarding photographs as accurate measureable records of external facts.

The first important generalisation we can arrive at is that the picture surface can only be an exact copy of the thing depicted when that also is a similar surface, and only then when the picture surface was parallel to the object surface at the time when the picture was taken. We may conveniently regard a photographic picture as a radiant production every point of which is at the end of a straight line coming from an apical point somewhere in front of the picture. Generally that point is somewhere inside the body of the lens, but it may be outside, either before or behind the lens, and it is called the station-point. The picture yielded by the lens is the same as would be obtained by a simple pin-hole at the station-point: a good lens gives a brighter and more sharply-defined picture than a pin-hole, but otherwise the pictures are the same in size and outline.

With this conception always in mind that a photographic picture is a collection of points at the ends of straight lines radiating from the station-point in the same directions as corresponding straight rays of light which have originally travelled from the objects depicted to that point or its adjacent counterpart, a correct understanding of many of the problems of photographic geometry becomes simple and easy. It becomes clear at once that when the true position of a picture is known with reference to its station-point any number of direction lines from the station to points on the objects depicted can be ascertained with ease, because they will be the same as the direction lines from the station to the corresponding points on the picture. To fix the actual positions of the object points it is sufficient to know their several directions from a known point and the distances of those points along the direction lines. Generally it is not convenient or easy to determine directly the distance of a point along a radius of direction. The most convenient and best way for general purposes is to find the horizontal distance first, then the altitude, when the actual line or distance will be the hypothenuse of the right-angle triangle of which the horizontal distance and altitude are the sides containing the right angle. To find the horizontal distance a method of intersection similar to the plane table method of land surveying is used. Photographs of the same objects are taken from different stations. The direction rays to any point whose position is required are observed and projected on a ground plan, when the intersection of the projected rays will mark the position of the point on the ground plan. The altitude can then be ascertained by determining from the picture the angle of elevation and computing the height which would subtend the observed angle at a distance already ascertained on the ground plan. Also the altitude will be a fourth proportional to three lengths, which can be measured directly. These are (1) the distance from the station to the projection of the image point on the horizontal trace of the picture plane. (2) The horizontal distance of the point from the station measured in scale feet on the plan. (3) The measured height of the image of the point on the picture above or below the horizon.

Or it may be determined by substituting values in a general formula h=d tad n, where h is the altitude above or below the station, d is linear horizontal distance, a is the angle of elevation observed from the station and tan, and is $\frac{\sqrt{y^2}}{f^2+x^2}$, where f is focal distance and x and y are abscissæ measured from the centre on the horizon and principal vertical lines as rectangular co-ordinates.

* Summary of a paper read before the Society of Arts on April 16th, 1902.

In practice there are no considerable difficulties provided we have enough accurate information about the pictures which are used.

The methods so far considered and explained in outline relate only to the fixing of points on a ground plan by the methods of intersections and of elevation by the particular methods described. These methods are almost universally applicable, and with moderate care they yield very accurate results with much less expenditure of time, money and effort than would be needed for an ordinary survey of the same ground with a plane table or any of the other known methods of surveying. In Canada this method has been largely used, and it has been found that the actual money-saving from using the photographic method was then two-thirds of the computed cost of a plane table survey. A similar saving has been computed as the result of using this method for the survey of Trans-Balkal Railway in Siberia; and it seems reasonable to believe that with the improved instrumental appliances of the present time, and others perhaps to follow, the saving of expense for surveys hereafter will be from 80 to 90 or perhaps even 95 per cent. of the cost of similar surveys in the past by old-fashioned methods.

When dealing with buildings it is often possible for the photographer, without difficulty or much loss of time to measure directly with a tape the perpendicular distance from the diaphragm of his lens to the wall of the building to be photographed. This distance can be noted on the picture. This scale can then be calculated and constructed in a few minutes, and all distances on the surface elevation can be measured directly with a pair of compasses and that scale.

Distances on parallel surfaces nearer or further away, such as projections, porches, deep-set windows or other recesses, will require different scales of measurement according to their distances in advance of or behind the principal surface, or the same scale can be used for measurement and the results divided or multiplied by a constant computed for the difference. Another way to get the scale is to place a rod of known length in close contact with the surface where its image will be entirely included in the photograph.

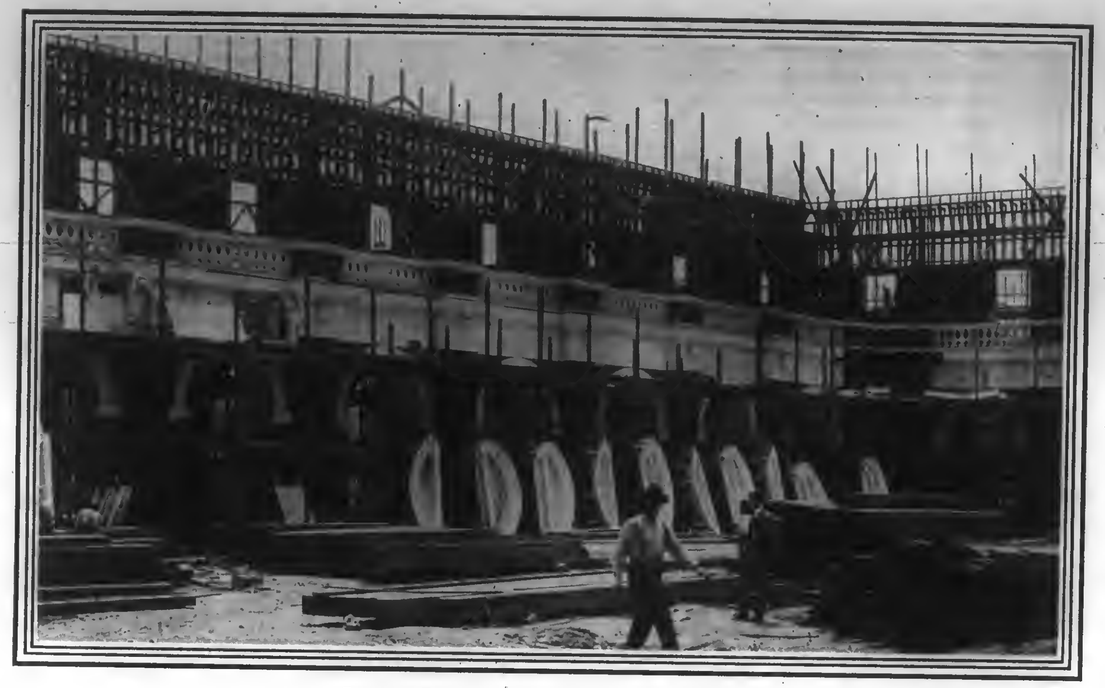
Sometimes it is not convenient to walk up to a building to measure the distance to it or to place a measured length against it. A very efficient plan then is to shift the camera a measured distance to the right or left parallel to the face of the building, and take a second picture, when, if due care has been taken to set up the camera perfectly square in both instances, the images of the vertical hair on the face of the building will include between them a slice exactly as broad as the measured distance between the two camera stations.

One way to investigate flat surface areas is to apply what is known as the method of squares. If we imagine a plain area to be entirely made up of small squares, then the position of any point in the area is sufficiently determined if it is known in which square it is located and what is its position in the square. When dealing with a front view it is sufficient to superpose on the picture a sheet of glass on which has been ruled or photographed a network of regular squares in elevation. If the focal distance of the picture be known, it is a very simple matter to compute the scale value of the squares for different distances of the object surface.

Next in order of simplicity of measurement to a simple frontal view of a plane surface will be a horizontal surface or plan. For practical work regular series of perspective squares may be engraved or photographed on flat sheets of glass to make what are called perspectometers, which can be laid in position on the photographs with the scale surface next the picture face. These perspectometers need to be specially constructed with precise reference to the focal length of the lens in each case.

The method of squares which has been spoken of as applicable to the measurement and plotting of elevations and plans can be applied also for the measurement of other receding flat surfaces, such as the roofs or walls of buildings.

Sooner or later the time will come when photographic projection will be systematically employed for teaching perspective, and it will be employed practically, on a large scale, for projecting images from one plane to another. We must not expect to obtain full knowledge of unknown objects of three dimensions by aid of a single photograph, or even a number of photographs from a single point of view. To study unknown objects thoroughly we need to be able to examine them from several different points of view and compare the views. The use of photography does not obliterate this necessity, though it helps very decidedly towards correct final conclusions, because it records faithfully the appearance observed at every station, and these views from different stations can be brought close together and directly compared.



COURT OF ELECTRICITY BUILDING. PUTTING ON STAFF.

LOOKING NORTH, SHOWING ELECTRICITY BUILDING IN FOREGROUND AND VARIED INDUSTRIES BUILDING WITH DOMES AND TOWERS IN DISTANCE.

BUILDINGS UNDER CONSTRUCTION FOR THE LOUISIANA PURCHASE EXPOSITION, ST. LOUIS, MO.

HOTEL DE CLUNY, PARIS.—(WOOD)

BY THE WAY.

The owners of flats in Chicago were recently proceeded against by the medical health officer at the instance of their tenants for refusing to supply heat until the first of May as per the terms of their leases. The courts gave the landlords the option of either heating their buildings or spending a term in gaol. The present coal famine, while bringing home to the owners of flats a sense of their burden of responsibility has tended to popularize life in a flat because of the lessened responsibility which attaches to this mode of living.

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Frank W. Hoyt, editor of "Stone" in a letter recently addressed to the publishers of this journal says: "There is one point on which I wish to commend your Journal, which is one of the most interesting that comes into my office— you give a good deal of attention to stone. It is my experience that architects as a rule know comparatively little about the nature of the different kinds of stone. The various publications that represent their profession give most of their attention to the consideration of structural material to iron and steel. Unless there is some change in the future, I fear that we will rear a generation of architects incapable of undertaking any great masonry structures such as have dignified architecture in the past."

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When a man has built for himself a house to dwell in he ought to keep in mind not only his own ideas and requirements, but also the value which the building would be likely to have in the eyes of a probable purchaser. In this world of ups and downs the man who builds a house next year may find it necessary to sell it the year following or at some time in the future. This possibility should be kept in view from the outset. I could point you to a house built recently to meet the special requirements of the owner, but which is now on the market. It occupies a choice situation, but the value of the site as well as of the building has to a large extent been destroyed in the planning. Although expensively finished, the house does not contain more than two or three rooms of comfortable size, but is cut up into little boxes and narrow passages. If the owner should ultimately succeed in finding a buyer he will be obliged to sell at a heavy sacrifice.

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I am informed on apparently reliable authority that there exists in Toronto a plumbers' combine. Half a dozen of the leading firms are understood to be working together to secure the most important contracts at very profitable figures. I am told that when an important contract is to be let the members of these firms meet together and decide that it shall go to one or other of their number with the understanding that the firm getting the job will stand aside in favor of another member of the combination when other large contracts are given. I have been given to understand that the combine have in some instances forced up prices of heating contracts from 50 to 100 per cent. Every effort is made to prevent firms outside the ring from getting contracts, by throwing discredit on the quality of their work. Are the architects aware of the existence of this combine and of the fact that because it exists their clients are obliged to pay fancy prices for their work?

C. A. & B. STUDENTS' COMPETITION.

The publishers of the CANADIAN ARCHITECT AND BUILDER invite architectural students in Canada to submit designs in competition for a suburban or town house to cost not more than $2,500.

The building is to be designed for an inside lot having a frontage of 50 feet, situated on the west side of a street running north and south. The adjoining lots on either side have houses on them 30 feet back from the street line and 10 feet from lot line on either side.

Competitors are required to submit two elevations or a perspective, together with plans of basement, ground, first and attic stories, drawn to ⅛ scale in a manner to permit of reproduction within the limits of a double page of the CANADIAN ARCHITECT AND BUILDER, viz., 10x15 inches in size, also details to a larger scale of important or special features of the design. Drawings must be made with PEN and PERFECTLY BLACK INK on WHITE DRAWING PAPER, OR CARDBOARD. NO BRUSH WORK WILL BE ALLOWED.

Competitors should state the materials proposed to be employed in construction.

Drawings for this competition should be signed with a motto only and be accompanied by a sealed envelope bearing the same motto and enclosing the full name and address of the designer and the name and address of his principals. They should be sent FLAT by post or express, charge prepaid, addressed "CANADIAN ARCHITECT AND BUILDER, Toronto, Canada—Student's Competition," and must reach this office not later than noon on Saturday, January 10th, 1903.

The members of the joint Educational Committee of the Toronto Chapter of the Ontario Association of Architects and the Toronto Architectural Eighteen Club have kindly consented to judge the designs submitted in this competition, and their decision will be final.

The prizes offered are: First prize, cash $15.00; second prize, cash $10.00, third prize one year's subscription to the CANADIAN ARCHITECT AND BUILDER ARCHITECTS' EDITION.

The publishers of the CANADIAN ARCHITECT AND BUILDER reserve the right to publish any of the designs submitted and to withhold the prizes if in the judgment of the jury the designs should not be found worthy of the awards.

Intending competitors are requested to read carefully the conditions of competition, and to strictly comply with the same in every particular.

The Department of Public Works at Ottawa is said to have under consideration the installation of a system of pneumatic tubes for the speedy conveyance of communications between the various government buildings.

CHAMFER STOP (BUTTRESS), HEDON, YORKSHIRE.

BUILDING STONES OF NOVA SCOTIA.

From a paper read before the Nova Scotia Institute on the Nova Scotia minerals for the Paris and Glasgow Exhibitions, we abstract the following notes regarding the location, character and extent of the deposits of building stones in Nova Scotia. The quarries are in most instances conveniently situated for either railway or water transport and for effective quarry work. These notes refer to the quarries in the northern part of Cumberland County, which furnished samples of their products.

Quarries at River John.—No. 1. This is the only quarry at present working in this district. It is situated at River John and about a quarter of a mile from I. C. Railway, and is connected therewith by a good road.

It contains a reddish sandstone of fine grain, and has been opened for about 350 feet in length, exposing a face so far of about 14 feet. Stones are cut here up to about 33 cubic feet, though almost any size could be obtained with larger machinery. The seams are very regular in formation and lie nearly horizontal. Worked for nearly a year.

No. 2 adjoins the first quarry, and resembles it in general characteristics, though the stone is of a lighter color.

No. 3, about a quarter of a mile up the river from No. 1, was worked for six years intermittently. Many grindstones were cut in this quarry, which yields a firm gray sandstone.

Wallace Harbor.—The Wallace Gray Stone Co., Wallace Harbor, John Stevenson, manager. This quarry is situated at Wallace, and a great part of the stone is shipped by water, though it is connected with the I. C. Railway by a good waggon road about two miles long.

Though the stone is carried to the wharf by horses, a tramway (gravity) could easily be operated, the quarry being situated on the hill. The distance is about a quarter of a mile. This quarry has been worked for a period of nearly thirty years off and on, and is still only partially developed. It produces an average of about 1,500 tons ("quarry") a year, of fine grained sandstone in two colors—"olive" and "bluish."

Blocks up to ten tons in weight and measuring fourteen feet are cut, and the greater part of the stone is shipped to the Boston and New York markets. The poorer stone is sold locally.

Wallace Harbor.— The G. P. Sherwood Co., T. C. Dobson, manager. This quarry adjoins the quarry of the Wallace Gray Stone Co., and the same remarks apply to it.

At Wallace Bridge the famous Battye Quarry is being operated by George Battye. Stone has been taken from this quarry since the year 1809, and there is still much in sight. It is situated on the I. C. Railway and the Wallace River. Chief market, New York and Eastern States cities. Blocks up to ten tons are cut. At present 25 feet of rock is shown in the face, with seams measuring from two to six feet in thickness. This is composed of a very uniform and beautiful sandstone, suitable for monuments as well as construction work.

On the River Philip, about five miles from Pugwash, is situated the quarry of McLeod & Embree. It produces a handsome red sandstone contained in seams from two to seven feet, and shows altogether 20 feet in the face. Blocks cut to eight tons. Has been operated for upwards of 30 years, and usually ships to the States. This year all the stone quarried is being supplied to Toronto.

The Atlantic Stone Co., Limited, R. S. Hibbard, Manager.—The quarry of this company is situated on Cumberland Basin, 3½ miles from Joggins Station, on the Canada Coal Company's Railway, and 16 miles from I. C. Railway. The stone is shipped chiefly by water, in vessels up to about 300 tons. The market is mainly in the New England States, though the stones are occasionally sent much further west. 2,000 tons shipped per year. This quarry produces a very superior form of grindstone. Stones from half an inch to 14 inches thick, and up to seven feet in diameter are cut, though almost any size that could be handled is procurable.

At Lime Rock, West River, Pictou County, are sandstone quarries yielding good building stone. Samples are shown by Mr. J. H. Fraser. In the Merrigomish district the strata lying above the Productive measures yield grindstones and fair qualities of freestone.

Other localities are Pictou, and Glenfallock. On the Basin of Minas, Cornwallis, Johnston Brook, Horton, Falmouth, Kennetcook, Nine Mile River, and Old Barns, have yielded freestones in some cases of delicate shades and good texture. In Cape Breton sandstones from the Millstone grit and the Coal measures have been used to a limited extent for building purposes.

Syenites, Porphyries and Granites.—Granite is very abundant among the older rocks of the province. Among localities which have furnished it for building purposes, may be mentioned Shelburne, Queens and Lunenburg Counties. It also occurs at Aspotogan and various points thence to Halifax. As already mentioned, in describing the Gold fields, it runs continuously from Halifax to Windsor, and thence westward. It occurs again at Waverley, and runs through Musquodoboit, Jeddore, Ship Harbor, Sherbrooke, and Country Harbor to Canso. It occurs inland at the head waters of many of the Eastern rivers, and is estimated to cover a large area of the Atlantic coast district. It has, however, been quarried only at points accessible to shipping. At Halifax, it has been used a good deal about the fortifications, and a number of houses have been constructed of it, its cost, rough, being from $2.25 to $4.00 a ton.

In the Colequids there are masses of flesh and red colored syenite, which have afforded very handsome polished samples; but as yet have not been worked for construction. Porphyries and syenites occur in various parts of Cape Breton, but their economic value has not been tested. The following localities may be mentioned: St. Ann's, Boisdale and Coxheath. The crystalline diorites of Louisburg were used by the French in building their fortifications.

Limestones.—This material has not been used to any extent in Nova Scotia for building purposes, although it is frequently found to stand exposure well, and to be readily quarried. Among localities yielding it, may be mentioned the Shubenacadie River, Kennetcook, Lower Horton, Thompson Station; Glengarry and Springville, Pictou County. Stones from a quarry here retain, after an exposure of sixty years, every trace of the chisel or pick. The marble, will be noticed further on.

A flaggy, arenaceous schist, known as iron stone, was extensively used some years ago for warehouses and walls in Halifax. Many of the metamorphic sandstones of the Atlantic coast would furnish a most pleasing and durable building material.

At present the supply of wood for building purposes is so plentiful that brick or stone houses are the exception. Even public buildings, churches, halls, etc., are almost always of wood ; but as this material becomes more expensive, the labor of the quarryman will succeed that of the lumbermen, and our towns become something better than wooded shells blackened by smoke.

Flags and Slates.—A small amount of flagstone has been quarried on the Northwest Arm of Halifax Harbor, and at Beaver Bank. Slates were quarried to a small extent at Rawdon, and various places in Hants County, and the quality and quantity are equal to any demand. Dalhousie Mountain and West River, Pictou, are said to have good slate beds, and it is also reported from the South Mountain, in Digby and Yarmouth Counties.

At the Provincial Exhibition of 1879, slates were shown from Sackville, River John and Upper Stewiacke, which, although in the rough, were of good material.

The demand for roofing slates will become general in the province in a few years, as their superiority over the shingles in ordinary use becomes apparent.

In Nova Scotia the limestones are confined practically to the Lower Carboniferous, and are generally associated with the gypsums. There are also beds of this material, sometimes metamorphosed into marble, in the Laurentian, etc., of Cape Breton, and in the Cambrian and Silurian measures, but they do not usually form deposits of economic value in the latter measures. The carboniferous limestones are strongly developed in Cumberland, Colchester, Hants, Kings, Pictou and Antigonish Counties, and at many points in Cape Breton. They occur in beds varying in thickness from a few inches to 50 feet, and in some localities their aggregate dimensions will exceed 400 feet. Their quality varies from calcareous sandstones and clays to the crystalline pure mineral.

At Windsor, Brookfield and many other localities beds are found composed entirely of fossils characterizing the Marine Limestone formation, and give the following component parts on analysis by Dr. How :

Carbonate of lime	97.64
Carbonate of magnesia	1.10
Oxide of iron	.07
Phosphoric acid	trace
Insoluble residue	.68

A limestone similar to the above was extensively quarried at Brookfield as a flux for the Londonderry iron ores.

The limestones of Pictou County are also well adapted for fluxes. The following analyses of a limestone from Lime Brook, Springville, were made for the Halifax Company at the Durham College of Physical Science :

	I.	II.
Lime carbonate	93.90	96.26
Magnesia carbonate	2.45	2.33
Iron peroxide	.59	.57
Manganese peroxide	.56	.55
Alumina	.12	.10
Sulphur	.03	.02
Phosphoric acid	.03	.03
Silica	2.10	1.99
Moisture	.18	.17

These results are confirmed by an extensive series of analyses made some years ago by the writer, embracing all the more important exposures of that mineral in the vicinity of the Pictou coal and iron deposits, but the space at my disposal would forbid its insertion. The position of the East river limestones forms an important item in their adaptability for fluxing purposes.

They occur as a band everywhere between the coal and iron, so that their transport becomes a matter of comparatively low cost, and large quantities are available by simple quarry work. A quarry at Black Rock, above Bridgeville on the East Branch, has furnished flux for many years to the Ferrona furnace.

THE ELECTRIC ELEVATOR.

Mr. Douglas, manager for Canada of the Otis Elevator Co., recently addressed the members of the Toronto Chapter of Architects on the development of the electric elevator. The first electric elevator was made in 1881, and strange to say the original principle of construction is still employed. Between 1881 and 1888 when the electric elevator became a commercial success, it suffered many vicissitudes. Its popularity is however now assured, and the modern electric elevator can be depended on to operate satisfactorily day in and day out, at any desired speed from 150 to 500 feet per minute. Many improvements have been made in the device, such as placing the operating mechanism at the top instead of the bottom of the shaft, thus securing economy of space. Elevators are now frequently installed in the more costly residences, and are fitted with antomatic appliances which render accidents almost impossible. For example the door will not open except when the elevator is within two inches below or above the floor. These elevators are fitted with a push button, corresponding in number to each of the several floors, and the elevator responds in the order in which the signals are given.

The Ministerial Association of Toronto have given their partial approval to Alderman Graham's scheme for improved dwellings for the poor, but wisely suggest that such dwellings should be located in the suburbs rather than in the heart of the city.

The death is announced of Mr. Peter James Murray, a prominent and highly respected contractor of Montreal.

The Canadian Fire-Underwriters' Association have decided to impose a special rate of insurance upon buildings in which are housed automobiles operated by gasoline.

We record with much regret the death of Mr. Wm. A. White, architect, of Lindsay, Ont. While superintending the building of the new hospital in that town he contracted a severe cold which developed into pneumonia and resulted in his death. Deceased had resided in Lindsay for 35 years, and during this period erected many important buildings. He was held in universal esteem.

—THE—

CANADIAN ARCHITECT AND BUILDER

A Monthly Journal of Modern Constructive Methods,

(With a Weekly Intermediate Edition—The CANADIAN CONTRACT RECORD).

PUBLISHED ON THE THIRD WEDNESDAY IN EACH MONTH IN THE INTEREST OF *ARCHITECTS, CIVIL AND SANITARY ENGINEERS, PLUMBERS, DECORATORS, BUILDERS, CONTRACTORS, MANUFACTURERS OF AND DEALERS IN BUILDING MATERIALS AND APPLIANCES.*

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BUSINESS NOTES.

Adams Automatic Self-Locking Sash Lock has been pronounced by architects and builders a most valuable invention.

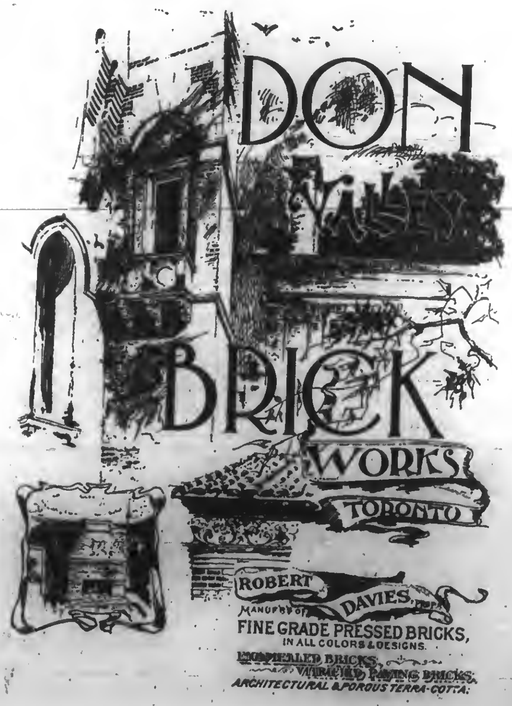
The Art Metropole, Yonge street, Toronto, are about going into the manufacture and supply of arcbitects' materials extensively.

Palmer's Patent Hollow Concrete Building Blocks will soon be extensively manufactured in Canada. We hope to give further particulars next month.

The Canadian Construction Co., of Toronto, are preparing to go into the structural and contracting work on a very extensive scale. Their announcement will appear in next month's issue.

The Patent Interlocking Rubber Tiling made by the Gutta Percha & Rubber Mfg. Co., of Toronto, Ltd., has proven a success. Their new announcement will appear in next month's issue.

The York Manufacturing Co. was established four years ago for the purpose of manufacturing in Canada a full line of laundry machinery, with the following gentlemen as officers:—Messrs. J. M. Spencer, president; H. G. Macklem, secretary-treasurer; W. Hawke and A. J. Spencer, directors. Mr. Spencer is a prominent citizen of Toronto, whilst Mr. Macklem has been engaged in various manufacturing enterprises for 27 years. Mr. Hawke is also a well-known Toronto business man. Mr. A. J. Spencer is town treasurer of Owen Sound. They are now manufacturing a full line of machinery for modern steam laundry business. They instal complete plants, furnish plans and estimates for public laundries, hotels, public institutions, hospitals, etc.



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BEAUMONT JARVIS, ARCHITECT.

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CANADIAN ARCHITECT AND BUILDER.

THE WM. DAVIES BUILDING, QUEEN STREET WEST, TORONTO.
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SUPPLEMENT TO
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DECEMBER, 1902

Chapel in Ancient Cemetery of Arles, called Alescamps (Elissii Campe), by which it was known Eighteen centuries ago. Dante mentions it in the "Inferno," and Ariosto alludes to it in the Orlando Fureoso.

La Rue de la Grosse Dorloge, Rouen, Built 1527.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
DECEMBER, 1902

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INDEX

Architectural League Exhibition - 2
Apprentices, Education of - 48
Apartment Life - 77-78
Alphabet, Architectural - 109
Art, Peasant - 112
Architectural Nomenclature - 123
Architectural Period, Table of - 128
Architect, Dismissal of - 160
Accessories, Architectural - 176
Abestos in Building - 192
Architecture as a Social Art - 50 to 56
Architecture, Street in Paris - 66
Accounts, Architects' - 84
Architect's Practice - 102
Architect, Qualifications for an - 103
Architectural Classes - 183
Architecture, Styles of and Styles in - 184
Architectural League of America - 180

British Trade Supplement - 2
Builders as Lumber Dealers - 23
By the Way, 24, 48, 64, 79, 107, 114, 132, 158, 166, 193, 199
No. 1-x-x-x

the north and west, the multiplication of industries in which cement is employed and the many new uses to which the material is being applied, there is no doubt still room for a considerable development of the industry. After the home demand shall have been met there will remain foreign markets to be exploited. There is no reason why Canadian cement manufacturers should not be successful in securing their share of foreign orders, as manufacturers in other lines are doing. The demand for cement is said to be rapidly increasing in the Spanish-American countries, as the result of the inauguration of extensive public works. No cement is manufactured in these countries, 95 per cent. of the demand being supplied by Hamburg and the remaining 5 per cent. from England. The French Commercial Adviser recently suggested that a group of French manufacturers of cement and mosaic tiles should form a syndicate and appoint five energetic representatives, who speak Spanish and are acquainted with the customs of the countries. They should be supplied with samples and visit the principal Latin-American towns with the object of obtaining government and municipal contracts. These representatives should be apportioned, as follows :—1. Mexico and Central America, Cuba and Porto Rico. 2. Venezuela, Colombia, Guiana and the lesser Antilles. 4. Argentina and Uruguay. 5. Brazil and Paraguay.

OUR BRITISH TRADE SUPPLEMENT.

A new feature appears in this number, in the form of a British Trade Supplement containing the announcements of a number of representative British firms engaged in the manufacture and sale of various materials for the use of architects and contractors. These British firms desire to introduce their goods in Canada, under the terms of the preferential tariff, and to obtain competent and reliable persons to act as their representatives in this country. The well-known reliability of British manufactured goods, and the desirability of closer trade relations with the mother country, should prompt Canadian architects and contractors to carefully examine the announcements appearing in our British Trade Supplement, to open correspondence with the various firms represented therein, and make fair trial of the goods offered. The publishers of the CANADIAN ARCHITECT AND BUILDER will be pleased to supply from their offices in Toronto and Montreal catalogues and information in behalf of these enterprising British firms.

C. A. & B. STUDENTS COMPETITION.

Thirteen sets of drawings have been received in our Students' Competition for designs for a $2,500 Town or Suburban House. The drawings are now in the hands of the Committee of Award representing the Ontario Association of Architects and the Toronto Architectural Eighteen Club. On account of the annual convention of the former and the annual exhibition of the latter in progress at present, it was found impossible to have the designs considered in time for the result to be announced in this number. The Committee's report, with perhaps one or more of the successful designs, will be published in February. Meanwhile we wish to express our appreciation of the manner in which the Students have responded to our invitation to enter this Competition. It will encourage us to announce others from time to time in the future.

ARCHITECTURAL LEAGUE EXHIBITION.

The Eighteen Club's display of photographs and prints, which constitute the circuit exhibition of the Architectural League of America, is of moderate interest. The most satisfactory work shown is in the collection of prints of English work, which are however very small and usually show no more than a distant perspective view of the parish churches which they represent. As English work, following English tradition, and suiting English taste and English church worship, these are admirable. An old English church or a modern English church may be, and are, of the same family, and the one seems as appropriate as the other: Mr. Cram, whose opinion given in his lecture before the Eighteen Club at the gallery on Jan. 17th, was courageously in favor of the same church design for the same form of worship in the Protestant Episcopal Church of America, is represented on the walls of the exhibition by a photograph of the well known drawing of his perpendicular church at Cohasset, Mass., but there is no getting over the feeling that this is an imitation, an English importation, planted on foreign soil. Whether this sentiment is reasonable or not, it is strong, and it is such sentiment that influences, or ought to influence the character of architecture, so as to bring it into the necessary harmony with its environment. It is safe therefore to say that the style of church design, which seems good on English soil and does not seem good on American, is good in England and is not in the United States.

The most interesting exhibit is without doubt the French work. French logic goes on where we only speculate, and the Frenchman becomes either a noble example or a shocking one. Even when he becomes a shocking example one cannot but admire the nobility of the spirit that led him to it. As a matter of fact the steel church, which is the text of these remarks (an uncompromising erection in unprotected columns of steel beams, rivetted together, and arched trusses of steel angle bars) bears study well and even grows a little upon the affections by study. It would at any rate inspire respect if not love, while a Chicago architect's church, which is shown both in its steel skeleton and again as a barrel vaulted structure; with coffers, vaulting ribs, arched recesses, and all the rest of it; excites nothing but loathing and boredom. It is dull.

The great interest of the exhibition, is Mr. Challener's decoration for the ceiling of the steamer Montreal, which forms part of the exhibition because Mr. Challener is using the gallery as a studio for this large painting. People who are accustomed to regard pastels as a convenient medium for amateurs, because it lends itself to a fuzzy effect that peculiarly suits a wuzzy manner of execution, should look at Mr. Challener's pastel studies and see that the real forte of pastels is a luminous brightness. The painting from these studies loses nothing in color. The ceiling will be a real work of art. The masses of floating figures—floating between dawn and darkness—form a decorative motive running through the two panels continuously, so as to carry on the idea which is represented by both together. And the figures do float: they form a large composition, are combined in interesting groups and are beautifully modelled, but they float like the irresponsible figures of a dream.

INTERCOMMUNICATION.

[Communications sent to this department must be addressed to the editor with the name and address of the sender attached not necessarily for publication. The editor does not hold himself responsible for the expressions or opinions of correspondents, but will, nevertheless, endeavor to secure correct replies to queries sent in. We do not guarantee answers to all queries neither do we undertake to answer questions in issue following their appearance.]

"H. R.," Fullarton, Ont., writes: You will greatly oblige me by answering the following questions through your paper. (1) Is cement a good thing to put with mortar used for plastering a smoke flue? I have heard cement will not stand fire; is this a fact? (2) What is good to mix with mortar (to be used for plastering a smoke flue), to give a glossy face? (3) Will mortar stain act as a good colouring for cement work?

In answer to the forgoing it may be said, (1) That putting cement in mortar for paving or plastering the inside of a flue, has no special advantages over plastering with well made lime mortor. (2) Cement, under ordinary circumstances will stand heat as well as, all lime mortar. (3) A flue can be made smooth inside by using good lime mortar, and then "trowelling" it well, or floating it until it is quite smooth. Our old fashioned method—and a good one—was to mix cow dung with the mortar and working the whole up into a thick paste and parying the flue with the maise. Flues treated in this manner keep a smooth surface inside for many years. Where fire clay is abundant it is a good plan to coat the flues with it, as it stands heat and remains smooth. One of the best flues is formed by using common glazed drain tiles for the smoke duct, which are built in the chimney. The brick flue, is of course left square inside, and the tiles are cemented at the joints as the work progresses. The angles or voids left, may be used with effect for ventilation purposes. Mortar colors will answer fairly well for the coloring of cements. Any of the mineral colors will answer the purpose, but, in all cases, the introduction of coloring matter, depreciates the strength and durability of the finished cement work.

From "Draftsman" : In answering my "query" in the October (1902) number of THE CANADIAN ARCHITECT AND BUILDER, you say : "Scale drawings can be reduced by the use of a pantograph." Will you please describe a "pantograph," and tell how to use the instrument?

ANS :—The following, which is taken from "Hodson's Universal Carpenter and Joiner," gives the best description of a pantograph, and the manner of using it, that we can lay hands on at this moment : "By reference to the engraving, Fig. 1, it will be seen that the instrument consists of four parts, resembling rulers jointed together at their extremities, and two sliding carriages, having provision on their under sides for holding a pencil, while they are provided with clamping screws to hold them in their places.

The pieces AB and AC are each two feet four inches long, from the centre of the screw at A, to the extreme end, one-inch wide and one-quarter inch thick. The distances centre AD, AE, FD, FE, are equal, being twelve and a half inches. All the joints of the instrument are made with one-inch screws, and small blocks of hardwood, one-inch by one-inch, by half-inch thick, are glued under each joint to form a good hold for the screws. It is scarcely necessary to say that all these screws should be filed or turned perfectly smooth and round, the ordinary wood-screws being too rough and irregular. The fulcrum B is a leaden weight four inches in diameter, and about one-inch thick, having a wooden stem in it, so that it measures two and a quarter inches from the underside of the lead to the top of the wooden stem. A stout needle or short piece of wire, is driven into the top of the stem for the instrument to turn on. The holes in the piece AB at B, are about half an inch apart, and of such a size as to slip over the wire on the fulcrum easily. The pencil used must be rather a hard one and must be nicely pointed by a file or a piece of sand-paper.

The sliding carriages G and C are made of two pieces of black-walnut or other suitable wood, 2"x1¼" x⅛" thick, and two pieces ½"x¼"x1¼" long; the small pieces are glued between the ends of the large pieces so as to make a block, with a hole 1"x¼" (the size of the rulers) running through it. The pieces AC and DF must now be slightly reduced so as to slide easily, but not too freely, through the holes in the carriages. Two ordinary thread spools with one end of each sawed off square, just where the level ends and the straight part on which the thread is wound, commences. One o

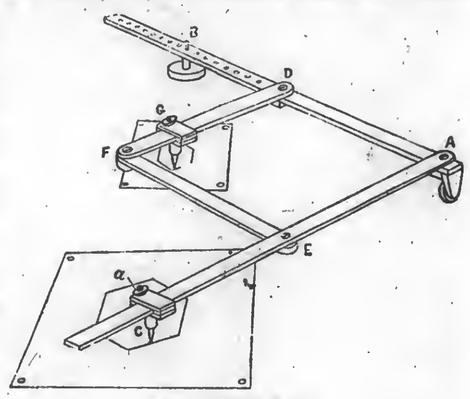
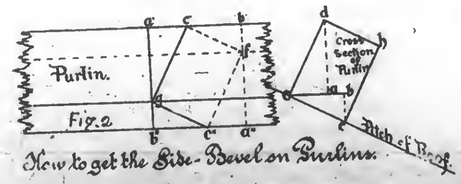


FIG. 1.—PANTAGRAPH.

these spools must now be glued to the centre of one of the thin sides of each carriage, and the opposite side must be cut through one of the joints where it is glued to the ⅛"x¼"x1¼" piece, with a thin saw, so that when that end is pinched together it will bind on the ruler, where before it slid easily. The clamping screw is made of a common 1-inch wood-screw, inserted from the side on which the spool is glued, and the head countersunk, in the centre of the width of the carriage, and ¼ inche from the end, thus passing through the middle of the joint that was cut. To prevent the screw from turning and also from dropping out a small wire staple similar to a double-pointed carpet tack, is driven across the head of the screw so as to lie in the groove, and a nut is made from a piece of hardwood one inch long by half an inch wide and three-eights thick, cut to an oval shape and slightly rounded on the underside, so as to bind only on the bottom as shown at A. In order to get a good clean thread in the nut, a tap may be made by taking a common screw of the size you are using, and with a saw-file making three or four grooves lengthwise of the thread deepest at the point. To reduce a drawing to one-half of the original, set the instrument so that a hole at B, which is in line with the points of the

pencil at C and G is just as far from G as that point is from C. The pencils should fit tight in the spools by wrapping paper around them; a screw may be inserted to hold them, but it is not necessary. In setting the instrument it is always necessary to have the pencils and the hole in which the fulcrum is placed perfectly in line. For this purpose a piece of wood the size of an ordinary lead pencil about four inches long, with a knitting needle driven into the end, so as to be in line with its centre, is very useful, as by placing it in the carriage at C, and then sighting across the point of the pencil at G to the point in B, they may be adjusted perfectly in line. The distance from B to C represents the original, from B to G the reduced copy; by varying either any amount of reduction may be made. Instead of two pencils a piece of hardwood the size of a pencil, made sharp at the point may be used with advantage at C, when reducing, and in G when enlarging. At A, on the underside of the piece A B, and just beyond the block under the screw, is glued another block 2 1-8 inches long, of the form shown, and at its lower extremity is fastened by a screw, a small wheel, readily made out of a coat button and projecting below the bottom of the block to which it is fastened one-eighth of an inch. When passing from point to point of the original and not wishing to make a mark on the copy, the pencil may be raised from the paper by raising the point at F a sufficient height. The method of using the instrument is very simple. If you wish to enlarge a drawing you place it under G and move the pencil or tracing point along its lines. New lines will then be traced by the pencil at G, and the drawing at C. Trace the drawing and the point G will define a reduced copy." There are several styles of this instrument but the principle in them all is the same. Every dealer in mathematical instruments keeps them for sale and the price varies from fifty cents to ten dollars. One good enough for ordinary purposes can be bought for about $2. Any clever carpenter can make one if he follows the directions given in the foregoing.

From "Carpenter": I am building a good sized stable and barn combined, and rafters are 28 feet long and I am obliged to put a purlin under them about half way up, and as the roof is "hipped," it will require to have the purlins mitred at the angles. How can I find the lines on the timber to cut this mitred joint?



ANS.—See Fig. 2 and follow the directions below and you will get the lines desired. Draw C E equal to the pitch of the roof, draw C D perpendicular to C E, and C D, H E equal to a section of the purlin. From D and E draw D A and E B vertical, and from C draw C B horizontal. Now take your purlin and square over two sides as A' B". Make A' C' equal to C A and B" C" equal to C B; connect C' G and C" G. This will give the cuts on the bottom and inside sides. The cuts on top and outside sides may either be obtained with a bevel, as they have the same bevel on opposite sides, or make C' B' equal C B, and C" A" equal C A, from B" and A" square over to F, and connect as shown. The dotted lines are supposed to be on the opposite side of the purlin. This will give the mitre for all equal and different pitches if the building is a rectangular one.

From "Cautious": Is it better to use a single timber for a girder or bressumner, than to make one or other of built up timbers?

ANS: Wherever possible, solid timber should be used. Built-up timber—that is timbers which are formed of a number of flat short pieces spiked, bolted or screwed together. In long stretches perhaps built up timbers may have some advantage, as the whole length of timber can be so constructed as to seem all in one length.

From "Stonecutter": Will you kindly describe (and illustrate) the proper method of laying out a segmental arch and oblige?

ANS: If our correspondent will carefully follow the

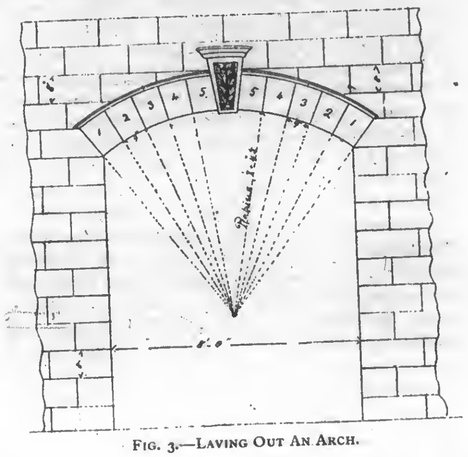


FIG. 3.—LAVING OUT AN ARCH.

sketch,—Fig. 3,—given herewith, he will see how all joints are made or set out. He must also see how the pocket pieces over the arch stones 4 and 5 are made. The lines for the bevels of the stones are obtained from the common centre O, the dotted lines showing the direction of the bevels. Care must be taken to free the the key-stone from the blocks above so as to equally distribute the weight and pressure.

TORONTO BUILDERS' EXCHANGE.

According to the reports presented at the annual meeting held on the 19th inst. the Exchange has enjoyed a prosperous year. the following officers were elected for 1903:—President, Joseph Russell; First Vice-President, R. G. Kirby; Second Vice-President, John Hoidge; Treasurer, David Williams; directors, Messrs. Nelson, Weller, Crang, Martin and Smallwood; Auditors, Messrs. Clay and Holmes; Representative on Technical School Board, J. M. Gander; Representative on Exhibition Board. J. B. Thomson.

The Industrial Publication Co., of New York, have recently issued a second edition of 100 cloth bound pages of Fred. T. Hodgson's book "The Hardwood Finisher," containing rules for preparing wood work for the finisher and for finishing hardwoods, as well as pine and other domestic woods. The price of the book is one dollar.

MODERN CONSTRUCTIVE METHODS.*

Had I seen Mr. Pearsons remarks delivered at your annual meeting of 1902 before accepting your Registrar's very kind invitation to read a paper at this meeting I greatly fear I would have refused.

At the best it is very embarrassing to a modest engineer, and modesty is the essential characteristic of the engineer, to appear before such a body of men as this. It becomes doubly so, when they have been informed in advance that he belongs to a 'clique who are using all their wiles and blandishments to seduce the simple-minded and unsuspecting architect into all kinds of nefarious schemes and awful projects.

Mr. Pearson's description reminds you of the Garden of Eden with the poor engineer in the role of the wise and subtle serpent, and the architect, whom I have always found perfectly able to take care of himself, under any and all circumstances, personating the lovely, but misguided Eve. However, I thank Mr. Pearson for one remark. He says: "For the solution of these problems it was necessary to appeal to the engineer." And he was right. In these strenuous days an Admirable Crichton, or a Lionardo Da Vinci becomes an impossibility. Competition is too keen; the lines are drawn too closely.

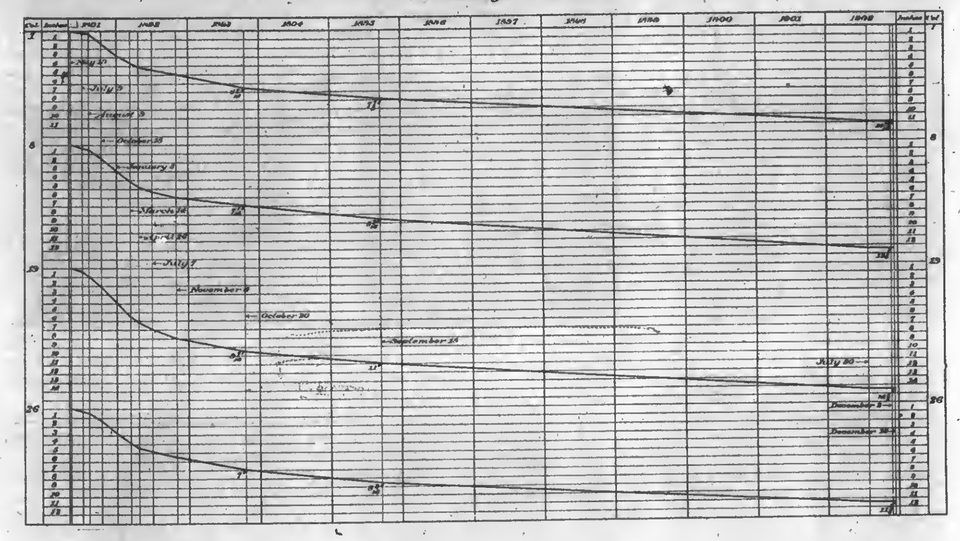
It is not many years ago that the architect felt himself to be, and was, perfectly competent to do any class of work which came to him. Now when he is designing a large office building, or any similar work he not only has to call upon the structural engineer, but the electrical, the mechanical, the sanitary, the heating and ventilating engineers as well.

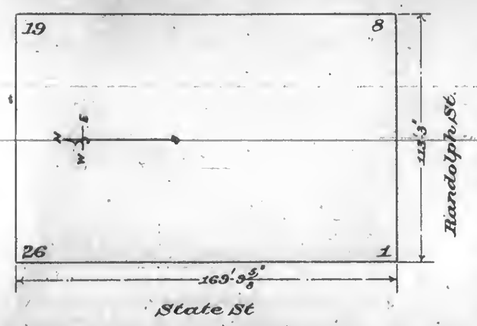
The architect is at the head, he is responsible for the completed structure, and the designs of the various engineers are only integral parts of the whole, but it is manifestly impossible for one man to know all of the details of the various lines. He may have a smattering of each, but he cannot know, he has not the time to master each and every one. When he tries to do so he fails.

After this somewhat lengthy preamble I will get into the subject matter of my paper.

The most interesting portion of a building to the structural engineer is the foundation.

Levels Showing Settlement of Masonic Temple Chicago.





In Chicago the very compressible soil made unusual care necessary in designing the foundations of the high office buildings.

The soil of Chicago is made ground to a depth of 12 to 14 feet thick, then a layer of hard clay 6 to 10 feet is struck, and upon this layer is placed the spread foundations. Below this layer is a soft clay extending down to a shale formation overlaying the rock, the latter being found at a depth of 80 to 100 feet.

The first high buildings were put on spread, or floating foundations made of steel beams imbedded in concrete. Each foundation was made of such a size that the load coming on the clay would not exceed 3,000 to 3,500 pounds per square foot. This often necessitated putting two or more columns on one foundation.

In figuring load on clay, only dead weight of building is taken into account, as it was found impossible to get a uniform settlement when live load was carried into the footings.

In one large and costly building in Chicago built some years ago after plans by a celebrated Boston architect, the live load was considered in designing the foundations.

The result is that the walls of the building settled very much more than the foundations, carrying the interior columns, and the floors are 6 or 8 inches higher at the center than around the outside. In consequence extra men are stationed on the floors to help the truckmen push the trucks up the incline.

The settlement of the buildings put on spread foundations is from 8 to 20 inches. This is allowed for by putting up the foundations when work is begun.

*Paper read at the annual convention of the Ontario Association of Architects held in Toronto January 13th and 14th, 1903.

The settlement curves of the Masonic Temple 300 ft. high are shown on preceding page.

The first vertical row of figures on the left give the number of the column, the next row the inches of settlement, and the other spaces on the right show the years covered by the observations. You will note that the settlement is not great for about 2 months after foundations were put in place, but as the building went up, and the loads on the footings increased the curve becomes very much sharper. You will also note that the greatest variation in the settlement of the columns occurred at the start when the difference in loads was greater, afterwards the settlement becomes almost uniform, changing at north-east corner when the smoke stack at column 19 was increased in height, causing an increased settlement at this point.

No settlement has taken place in the past 5 months as shown by the horizontal lines. It is, however, questionable whether any of the very high buildings ever entirely stop settling owing to the effect of the wind against them. The prevailing winds in Chicago come from the west and south-west, and the higher buildings when they lean at all, invariably lean east.

The Great Northern theater hotel and office building was erected east of the Great Northern Hotel built several years before. The hotel has a court in the center of the east side, and the theater of the new building adjoining the court on the west.

Heavy fire walls separate it from the office and hotel portions. These walls, each weighing, with the floor loads, 60,000 pounds per lineal foot, meet the east wall of the present Great Northern hotel at right angles. This east wall had been originally designed as a party wall, and its footing had been constructed strong enough to carry a floor load from each side. The end of the theater wall, where it meets the east wall could not rest on the footing of the latter, which projects 9 feet 6 inches, as it would overload the footing, being only on one side, besides being too great a load. The old building had also practically stopped settling, and the new one would probably settle 10 to 12 inches. The floor load, however, from the east side had never been put upon this footing, and in addition it was deemed safe to load it somewhat higher than it had been originally, as the east wall, fourteen storeys high, had been resting upon it for four years. Plate girders were placed lengthwise in the theater wall, with their ends projecting through the old wall, and resting on 36 ton hydraulic jack-screws, which in turn were supported by I beams lying on the footing and parallel to the old wall. The plate girders were of such a length and so located as to transfer to the old footing the desired weight. The screws were raised to their full height, so that they could be lowered 14 inches if necessary. As the new building settled these screws were run down at regular intervals until the settlement stopped. Levels are being taken on the building. After the settlement has entirely ceased the screws will be surrounded with concrete and left.

A rather curious example of foundation exists at Duluth. The Duluth General Electric Company very recently installed a 1,000 k.w. dynamo, and the vibration caused by it affected buildings 500 feet away. The vibration of a 5 storey building over 500 feet away was very perceptible. The building is close to the bay, and I found on examination that the ground is swamp and made ground, down to about 16 feet, where a hard strata is found. This made ground is filled with water and transmits vibrations in waves.

The buildings are built on piles driven into the hard ground, but the top 16 feet are entirely unsupported laterally. One building, however, also about 500 feet away, was found to have no vibration whatever, and it developed that when the foundations of this building were put in the whole area was excavated down to the hard ground and filled with sand to the top of the ground.

In order to avoid the excessive and long continued settlement due to spread foundations, piles were used, and latterly concrete caissons going down to the shale overlaying the rock, or going down to the rock itself are supplanting both. When it is not found feasible to go clear to the rock the caissons are belled out at the bottom, generally to twice the diameter of the caisson itself: that is a 6' caisson is belled out to a diameter of 12 feet on the bottom and the angle of the slope of the bell is about 30 degrees with the vertical. Where the caissons go to rock the belling is not necessary. The caissons are made by digging down from 4 to 6 feet, just as a well is dug, and then lining up the shaft with wooden lagging, the strips vertical, held in place by iron hoops made adjustable. Then another section is excavated and lagging put in, and so on down. When bottom is reached concrete is put in, and lagging removed one section at a time until hole is filled.

One building now being erected will rest on about 90 caissons from 7 to 10 feet in diameter, carried down to rock which is from 100 to 104 feet below surface of ground.

A large State Street department store now occupying a 6-storey building, has just started to tear down the old building, and erect a 16-storey building in its place. The foundations for the new building, however, are all now in place, and have been put in during the past three months. Over 60 concrete caissons from 60 to 80 feet deep have been built without disturbing the old building, and without the knowledge of the thousands of shoppers who daily filled all the floors above. In some cases it was necessary to shore up the old building, and take out an old basement pier and put a caisson directly under it. At night the material excavated during the day was taken up to the street through an opening in the sidewalk, and hauled away in wagons.

Concrete caissons and piles are often used in foundations of some buildings.

There is no settlement when caissons are used beyond that due to the shrinkage of the material while being put in place.

The use of concrete either in large masses, or reinforced by steel has made great strides in the past few years and continues to grow in favor.

The drainage canal used it in immense quantities and in some cases in a very bold manner.

These two views show a recent concrete structure, for the Economy Light & Power Company at Joliet, Illinois.

The next (not shown) shows steel cylinders filled with concrete. These cylinders are 7 feet in diameter, 52 feet high above the masonry and carry the ends of two 380 feet spans. The masonry piers are only stone on the outside, the stone being 24 to 30 inches thick, and the interior is concrete.

I have here three samples of concrete. Numbers 1 and 2 were taken from foundations of the L.S. & M.S. & C.R.I. & P.R.R.'s at Van Buren Streets which were put in about 31 years ago.

Sample No. 3 is about 8 months old, and is taken from the foundations of the new station now being erected.

The old station was built with limestone walls. When the building was torn down this limestone was put through a crusher, and the concrete of which this sample is made is from the limestone just as it came from the crusher without screening.

FIREPROOFING OF STEEL FRAME.

After foundations, next in importance comes the fireproofing of the steel frame of the building.

Concrete floor systems are now being exploited in great variety.

Some of the systems have merit, but all of them make too great claims.

A concrete slab 3 to 4 inches thick, even if reinforced with steel in some form or other, should not be used in a very much greater span than we now use for steel beams with hollow tile arches between. It has beengrtavely told me by a concrete sales agent that in case of fwo 15 in. beams, say 7 ft. span it would be perfectly sae not only to deduct the difference in weight of floor between the 3 in. concrete slab they proposed to use, and the weight of a 15 in. hollow tile arch, but in addition the section can be reduced 25 per cent. on

Oct. 12th, 1895.

Oct. 19th, 1895.

Oct. 26th, 1895.

Nov. 12th, 1895.

Dec. 12th, 1895.

April 29th, 1896.

account of the help the concrete gives the steel. In other cases they state you can, with concrete, use 17 to 25 foot spans, and save all the steel thereby taken out.

One question, however, they decline to answer. Ask them instead of telling the vertical load it will support without collapsing to turn their slab of concrete 3 in. or 4 in. thick and 17 ft. to 25 ft., span, on edge, and then load it. They invariably decline to test it this way. Now in a 20 or 30 story office building, lateral stiffness in the floors is more essential than carrying capacity. A thin slab of concrete laid on top of 12 or 15 beams cannot by the very nature of things, add to the lateral support of these beams. But a 12 in. or 15 in. hollow tile arch laid in between the beams does make a stiff floor.

Experiments as yet have not demonstrated that concrete floors are fireproof as compared with hollow tile which already has been burned.

While I have faith in concrete and believe it has great possibilities which will be demonstrated in the future, yet I think that now, in order to compete with hollow tile, its advocates are making claims which cannot be substantiated, and in the future they will have to be more conservative not only in their statements, but in their construction in order to succeed.

Recent failures in Jackson, Michigan, where the falling of the floors pulled down the outside walls; and of four floors which collapsed in a $500,000 apartment building in Chicago will undoubtedly prove beneficial in the lessons they teach. Many other failures in concrete floor construction have occurred in the past few years, but these are the most recent.

Another thing, a building is not necessarily fireproof because it has steel floor beams and columns. Naked steel or cast iron is not fireproof. Wood is far preferable, for if it is of sufficient size it chars on the outside, and the charring acts as a protection. Every bit of structural steel must be covered with a fire-resisting material in order to be fireproof.

The last engineering papers give an account of destruction by fire of two English spinning mills, one resulting in the death of nine persons, injury of a large number. The report sums up both disasters as due to the breaking of the cast iron posts, but the same report says the cast iron posts were left bare. In the absence of further information it is only reasonable to suppose that the true cause is that these columns were not fireproofed.

Another and possibly a greater danger than fire is rust. Examination of steel buildings made recently show that the danger is not as great as some alarmists would have us believe, yet it exists.

In a building built in Buffalo in 1895 all the outside columns were filled with cement grout after the brick and fireproofing had been put around them, thus making the whole pier solid monolith with steel core. This

s now being generally followed in the best buildings. While the interior columns do not need this treatment, it is well to fill around them solidly at every floor, because if it does nothing else it will prevent rats and other vermin going from one floor to another. Floor loads: The building ordinances of the different cities cover all cases so completely, that very little is to be said. New York and Chicago both demand 100 pounds per square foot for each floor of an office building, or one to accommodate public gatherings.

WIND BRACING.

A great deal has been written about wind bracing in high buildings, and a great many methods of taking care of wind pressure have been brought forward.

Diagonal rods and portal bracing have been tried, but but interfere too much with floor space, and the former especially can not be carried out and made a perfect system.

In the Fisher building Chicago erected in 1894, the wind was taken care of on the table leg principle. Around the outside of the building at every floor the spandrel sections were made of plate girders 30 inches deep run between the columns and riveted to them. Each floor was supposed to transmit pressure to all the columns of the building in that story, and so on to the ground.

TIME OF CONSTRUCTION.

The views shown on preceding page of the Fisher building show the time in which a steel building can be erected.

DISCUSSION.

Mr. Shankland: These curves shew the settlement of the Masonic Temple in Chicago from 1891 till about two weeks ago, on December 15th. The figures on the left are the numbers of the columns at each corner of the building shown on this sheet. The building is twenty stories in height. You will notice the curves are quite easy for the first few months of construction. The zero was taken at the first construction. As the building becomes older the curves become very much sharper and the greatest portion of the settlement had taken place at the time the building was finished. The first shew the dates from 1895 to 1897; the settlement was almost exactly uniform. Then they put extra weight on corner No. 19; they ran the stack up higher; and you see, in the increased curves there, that the founda ion was affected at once. The settlement was 10 5-16 inches, 12⅞ inches, 14½ inches, 11 9-16 inches. The greatest settlement is 14½ inches; the least of those four corners is 10 15-16 inches. The foundation was on spread footings, the load was 3,200 pounds dead load.

A Member: How much of that settlement is live load responsible for.

Mr. Shankland: I do not think the live load causes any additional settlement. I do not believe a building of that size in Chicago ever stops settling; I believe the wind pressure has enough effect to keep a small settlement.

A Member: In that case inside columns would not be affected by the wind.

Mr. Shankland: The building acts as a monolith in that way. From July to December last there is no settlement shown. The levels were taken then. But that is too short a time to place any dependence on. This next photograph shows a work of solid concrete, twenty-six feet high and from six to eight feet on top. This is the Economy Lighting & Power Company of Joliette which is using drainage water to generate power to send to Chicago. That concrete work is not reinforced at all. It is a solid mass of concrete. The next photograph is shewn to illustrate the way concrete is used in bridge piers; those cylinders are seven feet in diameter and fifty-two feet high filled with concrete; the masonry is above high water but it is only a shell of masonry and the interior is all cement concrete. Those piers are 62 feet long and 22 feet high. The concrete is figured to carry the load and the steel only acts as wind bracing.

A Member: Why was not concrete used for the foundations.

Mr. Shankland: It would have been better if they had concrete instead of the natural stone, but the Board of Directors were not willing to allow concrete to be used to that extent. I wanted to use concrete. Piles were driven to the rock; they were sawed off and the building put on top. These next six views simply show the time it takes to construct a steel building. These views are of the Fisher Building eighteen stories high. The first view is on October 12th; the next is one week later, October 19th, and the next on October 26th. And the next is on November 10th, two weeks later.

A Member: Working night and day.

Mr. Shankland: Yes. The next view is taken on December 12, just two months from the time the first picture was taken. The next picture is in the April following and shows the completed building; it was rented from the first of May.

Mr. Denison: It hadn't time to settle.

Mr. Shankland: It was built on piles.

Mr. Wickson: Mr. President, we have all listened with great pleasure to Mr. Shankland's paper. He should live in a civilized place where they have a bottom to build on, not in a place like Chicago where they can't find bottom without going so far down. I do not wonder they have to pay so much attention to fire proofing when they have to go so near the centre of the earth to get a foundation. I want to ask a few questions. Mr. Shankland said that in calculating the load on the ground he does not pay any attention to the live load on the clay. Is that the case in all kinds of soil?

Mr. Shankland: It is the case in everything in Chicago. Of course a factory building or warehouse is always built on piles and there you take in a certain proportion of the live load. But in the spread footing of an office building the live load is not calculated.

Mr. Wickson: That applies more particularly to Chicago rather than universally?

Mr. Shankland: Yes.

Mr. Wickson: In looking over the Building By-laws of Washington I see that they take into consideration a considerable portion of the live load, thus following certain authorities.

Mr. Shankland: You naturally would if you did not want to get too great a settlement in the building.

Mr. Wickson: What do you say the proportion of concrete is in the caissons?

Mr. Shankland: One, three and six.

Mr. Wickson: How near are the caissons built to the party wall in that building you mentioned?

Mr. Shankland: They are built in the centre of the party wall; it is on a street on two sides—it is The First National Bank building. They are built in the centre of the party wall on the other side.

Mr. Wickson: In a case of that kind are the builders allowed to go to the street limit with foundations.

Mr. Shankland: They are allowed to go out to the kerb line.

Mr. Wickson: You have spoken about concrete and its uses; you have also given us some illustrations. Although concrete is being used so much in some respects I have found great difficulty in getting any data when I wanted it for concrete building—I mean the superstructure, not so much the foundation. It is rather a new thing; but still it is being used in some places. Can you give us any way by which we can get data for the strength of the superstructure of a building.

Mr. Shankland: Elsner & Anderson of Cincinnati are trying to get a permit for a sixteen story building. They have not succeeded in getting the permit yet. I do not know how they have figured the concrete. I looked over the plans and, taking the floor load at 100 pounds, and the concrete itself is seven inches thick in the floors, I found they had 83,000 pounds on the basement columns without taking into account the floor itself.

Mr. Wickson: In your address your criticism was largely as to concrete floors.

Mr. Shankland: Concrete floors altogether.

Mr. Wickson: If we take the dictum of a paper called "Fire Proof" we would not use concrete in any shape. It says "During the mediaeval period concrete was extensively used for tombs; the same is true even unto this day." I suppose we will have to wait for further development in regard to superstructure, in building.

Mr. Shankland: There are going to be great advances made in reinforced concrete in the next few years; but we do not know yet how they are going to take care of a concrete building.

Mr. Wickson: In your address and also in an article in the last "Brick Builder" there is this clause, "Good Portland cement even in thin layers is an effective preventive of rusting . . . . . it is of the utmost importance that the steel be clean when bedded in the concrete." It seems to me a great difficulty is getting the steel actually into the building without spots being exposed, even in the handling of the steel, provided it is properly treated at the mills. I suppose in very large buildings they have some way of overcoming that; but in the ordinary building such as we get in Toronto what is to prevent these places from being exposed to rust?

Mr. Shankland: We used to give it a coat of oil at the mill and a coat of paint at the job, and a second coat after erection. We do not now paint it at all till after erection. A little red rust won't hurt steel at all; it is the mill scale which if painted over will come off sometime and take the paint with it.

Mr. Wickson: Then if the steel be delivered on the job properly clean, it is quite sufficient to paint it then?

Mr. Shankland: After erection.

Mr. Wickson: With the use of the wire brush.

Mr. Shankland: That is used after erection. But after two or three months the greater part of the mill scale is off, and what remains is loose enough to be easily scraped off.

Mr. Wickson: In the steel caissons for the concrete bridge piers you showed on the screen, you said the steel work was for bracing against the wind. Would that steel ever rust?

Mr. Shankland: It has got to be painted outside and is right up against concrete inside and won't rust inside.

Mr. Wickson: It depends on the paint outside.

Mr. Shankland: We investigated a good many buildings in Chicago last spring; the oldest was about fifteen years old. We cut into the foundations of eight or ten or a dozen of them and we did not find a particle of rust in the foundation. Some places we had to bale the water out when we cut away the concrete. But the blue-black of the mill was on them in every case; there was not the faintest indication of rust. Steel should not be painted when bedded in concrete.

Mr. Wickson: That leads me to ask another question. The preservation of steel seems to be very complete where it is coated with cement, and I notice in the "Brick Builder" also that there is a statement that the use of hollow porous terra cotta blocks in connection with the cement is now considered to be an excellent method. I did not quite see how they would use them. Was it a matter of entirely coating or casing the steel work with the cement first?

Mr. Shankland: Plastering against the beam and tile.

Mr. Wickson: The columns would be filled as you mentioned.

Mr. Shankland: Yes.

Mr. Wickson: I am not sure whether it is a fair question to ask you if any of these patent paints so extensively advertised have been found to have special merits.

Mr. Shankland: An architect does not get a chance to see the steel after it is in the building. I have always followed the best bridge engineers' practice in the United States and that means red lead and linseed oil. I have never used any of the patent paints. If architects had a chance to investigate for themselves they might be able to do it; but, as it is, the only thing is to follow your leader.

Mr. Wickson: Have you ever on any occasion found the beams which are sent out from the mills not sound? What defects have occurred? Are they tested at all at the building as they are used.

Mr. Shankland: Only surface inspection. That should be made at the mill.

Mr. Wickson: Is there any other test.

Mr. Shankland: No. There couldn't be any other test. We have an analysis of the steel at the mill; and then the surface inspection is made to see that there are no surface defects.

Mr. Wickson: I ask you that because there were a couple of cases I happened to hear of in which beams collapsed or broke before they were really in place, after they had been delivered at the building.

Mr. Shankland: I do not think that has happened for a few years. When they first started manufacturing steel they got internal strains in the steel. When the market building was in progress they unloaded a beam from a wagon on the street and it split up about six feet. But now they are making so much better steel than they did that it is not dangerous.

Mr. Wickson: Could you give us approximately what the percentage is of extra cost on a building which is made all fire-proof over one that would be well constructed without being fire-proof?

Mr. Shankland: I could get nearer doing that a year ago than now. In the present conditions of work it would be hard to say. It would run from twenty-five to forty per cent. Steel itself is forty per cent. higher than it was two or three years ago.

Mr. Wickson: There is one other question I wanted to ask you although it hardly comes under your paper; I am going to ask it for the general use of architects. What are good hand books to use for construction formulae.

Mr. Shankland: The best books are the Carnegie and Pencoyd pocket books.

Mr. A. H. Gregg: What about the various text books?

Mr. Shankland: I hate to discuss books of that sort in a gathering like this.

Mr. Denison: They are compilations.

Mr. Shankland: That is it. You can't depend on all being reliable. The American Bridge Company is getting out a specification that promises to be very valuable; it will give floor loads and methods of construction, the building laws of the different cities, and a great deal of data of that kind.

Mr. Wickson: I should like to be the mover of a vote of thanks to Mr. Shankland for his paper.

Mr. Jarvis: Mr. Wickson asked a question with regard to data for figuring the strength of concrete. I do not see why that should not be a very simple thing to get at, by going to the School of Science and having tests made. It is a very simple matter provided we are always sure of the cement; and that is not a difficult proposition either, so long as you have it tested one week before the time that it is to be put into the works. I am sure that it would be one of the most accurate things in the world do deal with, just as accurate as steel, because it is so very positive; that is, cement is a positive article to deal with, and so is your crushed stone, if you have them both right. With regard to making beams and columns of concrete, it seems to me that that is also a very simple matter to deal with, having them strengthened with steel rods to increase the tensile strength of the concrete and that it would be a splendid thing for the Association to take up with the School of Science through Prof. Wright. I am satisfied myself that there is nothing in the world equal to cement concrete armoured with steel for almost every kind of building construction which will be better and cheaper than steel. I happened to pick up a paper in Prof. Wright's office a few days ago which told of some engineer reading a paper, to the Society of Engineers

in Cleveland which went as far back as the time that the Pantheon at Rome was built, which has a dome of 142 feet span built entirely of concrete. He says that this has stood the elements for nearly 2,000 years without the slightest weathering; and that in England, in certain places where the natural stone was used for facing, and concrete was used as a backing, that the natural stone has entirely disappeared and that the concrete, which was intended to play the secondary part, is there as good as the day it was put in. In this paper the engineer says that we are returning with rapid strides back to the old and time honored masonry construction, not of bricks and stone, but of artificial stone, namely concrete armored with steel. I should like to ask Mr. Shankland if an artificial stone composed of Portland cement and crushed stone in proportions of 3 to 1, the stone having the dust removed, would not be absolutely indestructible as to its weathering qualities. I have been studying concrete for the last two years and I do not know anything so fascinating or interesting as science and art in this study; and it is marvellous how few people seem to understand the first principles of making concrete. I have not seen it myself but I have been told by people who sell the raw material to the city that our engineers won't allow anything smaller for making concrete than what will go through a ¾ inch mesh; that, after he has got his stone from probably 2 inches to ¼ of an inch, the rest of it is cement and sand; they reject everything smaller than ¾ of an inch. The voids between the ¾ of an inch pieces would be considerable, and the amount of cement necessary to surround the sand which is necessary to fill up these voids would certainly weaken the concrete to a great extent, unless this crushed stone were graded from 2 or 2½ inches down to probably a 10,000th part of an inch, and only dispensing with the dust. If you were to crush the whole of your stone down to the size of an 8th of an inch in order to make a very fine concrete or cement stone for the exterior surfaces of buildings, and you do not want anything larger than an 8th of an inch, there would be a great deal of powder in that. It would be half powder. It would be a powder that would go through a 100th mesh; that is, 100x100 being 10,000, 10,000 grains would go through to a square inch; that should be rejected. But if we were to use from 2 inches down to the 10,000th part of an inch, so that there is not any powder left in it at all, and so that there is just enough space left for the cement to surround each particle from the largest down to the 100 mesh, it is something you cannot miss and is the real science of concrete working; and it seems to me it is just as easy to deal with as steel in figuring out beams and columns. But you have to get your formulae by actual test.

Mr. Burke: I have very great pleasure in seconding the vote of thanks proposed by Mr. Wickson. I would like to ask Mr. Shankland if he has made any examination of the outer columns of buildings cased with half brick or with a thin terra-cotta shell, in the manner so much in vogue a few years ago in Chicago. It seems to me that steel would be more likely to suffer damage by rust in a place like that than in the foundations.

Mr. Shankland: We examined the south-west corner column of the Pontiac building, in the 8th floor, last year. That was built in 1889. The only covering it had was 4 inches of pressed brick on both sides of the corner and fire-proofing inside. There was not a particle of rust to be found, and we opened it up for about 4 feet.

Mr. Burke: Was the brick laid in cement.

Mr. Shankland: Yes; it is just 4 inches of pressed brick.

Mr. Denison: Do you ever advocate the use of common mortar in a case of that sort.

Mr. Shankland: No, not in high walls or in a skeleton building.

Mr. Denison: Mortar would not have the same effect in protecting the iron as cement.

Mr. Shankland: No; not lime mortar.

Mr. Pearson: What form of wind bracing do you think best.

Mr. Shankland: That shown in the Fisher Building; plate girders riveted in between the columns. When the wind strikes the building all the columns in that story go together. The stiffness of that floor will bring into action all the columns in the story.

Mr. Pearson: In treating the expanded metal floor your idea was to treat the floor as a column.

Mr. Shankland: Treat the floor as a stiff plate.

Mr. Pearson: If you take the stories about 12 feet high at 40 pounds wind pressure—that would be about right.

Mr. Shankland: That is very heavy.

Mr. Pearson: Well, taking that pressure, every horizontal foot of wall abutting against the end of a bay of floor would exert a pressure of 480 pounds and the cross section of a 4-inch floor per foot being 48 inches, the pressure would be 10 pounds per square inch.

Mr. Shankland: Well!

Mr. Pearson: Can we get any data or information about that?

Mr. Shankland: I do not know of any as yet.

Mr. Pearson: Mr. Barrett, of the Expanded Metal Co., is here. We should like to get information on this matter; it is important. What is the deflection of the floor for the load? This is a factor in the matter. There are three forces in action, the dead strain, the live load and the lateral pressure, and the vertical loads work against the lateral pressure.

Mr. Shankland: A heavy wind is nothing but a blow; it does not last long nor does it cover an extended area.

Mr. Pearson: I wanted to get at some data in connection with the strength of these expanded metal floors. The manufacturers tell us that 3 inches is ample to do the work, but they give no data and no information; we must work the thing out ourselves.

Mr. Shankland: What I say is that a concrete slab should not be used in a high building where lateral stiffness is necessary.

Mr. A. H. Gregg: You mean where the wind gets at it.

Mr. Shankland: Yes. For a vertical carrying load it is another matter; but in a building 280 feet high and 70 feet wide lateral stiffness is very important.

Mr. A. H. Gregg: If you do not have a building over eight or nine stories it does not matter.

Mr. Shankland: Not if the area is corresponding, if the area is great enough.

The President: When you sink long columns into the earth, do you consider the earth at all as an assistance in preventing torsion.

Mr. Shankland: Of course if the clay is stiff enough it will give some lateral stiffness.

The President: Do you rely on it at all?

Mr. Shankland: No; neither can we give any figures for a 7 or 10 foot column 100 feet high, we have never tested one except theoretically.

The President: Under a partry wall it might not be possible to insert a column of large diameter. I suppose in that case steel rods would make a small diameter possible.

Mr. Shankland: Yes.

Mr. Baker: We have all listened with great pleasure to Mr. Shankland's instructive lecture. What strikes me particularly in Mr. Shankland's remarks about concrete is the apparent poverty of it compared with what we specily here. Mr. Shankland stated that he specified one, three and six; in Toronto I think we generally specify about one, two and four or five for building purposes.

Mr. Shankland: We think you are extravagant.

Mr. Baker: I suppose we are; that is what we want to get away from, and no doubt will when our cements are thoroughly proven. In those bridge piers what load per square foot did you put on the concrete columns.

Mr. Shankland: Twelve tons at the top. In these caissons the ordinary load is 15 tons at the top.

Mr. Baker: I am not clear myself, and I do not know whether we all are in reference to your statement that you do not provide for any live loads in preparing the foundations of the interior columns. Of course 3,000 to 3,500 lbs. per square foot on the ground we would consider extravagant building here; I think we sometimes go up to 2 or 3 tons. By the dead load do I understand you to mean simply the weight of the floors themselves?

Mr. Shankland: The weight of the building.

Mr. Baker: The dead weight and lateral thrusts and everything of that kind. You do not include any superimposed load?

Mr. Shankland: This is only office building construction.

Mr. Baker: Of course if it was only office buildings you referred to the live load is small but you also referred to pushing trucks up an incline and that made me think it was in some warehouse building.

Mr. Shankland: It is a warehouse.

Mr. Baker: I should think there would be tremendous superimposed loads in a building like that.

Mr. Shankland: The outside walls settle very much more than the interior columns. The worst settlement is the walls and you never can counteract the first settlement.

Mr. Baker: Given a floor area of 200 sq. feet and a dead load of 40 lbs.—a superimposed load of 100 lbs. in a 10 storey building would raise the load on the ground from 3500 to 8500 lbs. which in Chicago might be rather high. Mr. Shankland referred to foundations going down 80 or 100 feet in the ground. My attention was drawn to a building in New York, where they are utilizing all that space for offices; in one case they are putting in eight stories of offices under ground. There is no rdason that I can see why those could not be used.

Mr. Shankland: In New York they excavate in rock. In Chicago it would be a very difficult matter to keep the water from the lake out of the foundations.

The President: Have you examined the Stock Exchange in New York? They have excavated there some 30 or 40 feet of quicksand, and the seepage in the cellar was nothing when I saw it.

Mr. Shankland: In the Sherry Building they have put in a waterproof caisson and there they started at the surface on one side and had to go down 80 or 90 feet at the other.

Mr. Baker: What is approximately the cost of fire proofed buildings per cubic foot in Chicago.

Mr. Shankland: They run from 35 to 50 cents. That depends on the interior finish. In New York they cost 50 to 75 per cent. more than that on account of the interior finish.

Mr. Duck: I should like to ask Mr. Shankland what method he took to ascertain the proper proportion for concrete, that is of cement, sand and stone.

Mr. Shankland: That has been done several times in the physical laboratories; when we started crushing the limestone for the station they made an investigation of that, and the result of it in the tests was that you could get a stronger concrete to use it as it came from the crusher. All that has since been substantiated by the University of Illinois; and I think Perdue made some tests.

Mr. Duck: Is that in all kinds of stone? How about granite?

Mr. Shankland: Over at Perdue they used only limestone. I do not know about granite; it would not be so important there; it makes a stronger concrete.

Mr. Duck: The limestone in different localities varies very much. Some of the limestone is almost as fine as impalpable powder. In other sections we get a much better crushed stone.

Mr. Shankland: This limestone comes from Southern Indiana that we use in Chicago.

Mr. Duck: The process of pouring water into a receptacle full of crushed stone to get the amount of sand necessary to fill the interstices; then pouring water into this quantity of sand to get the amount of cement necessary to make a solid mass of the three substances usually comes out one, three and six, in taking a stone such as crushed boulders.

Mr. Jarvis: I should like to ask Mr. Shankland if cement made with a hard crushed limestone that would pass through an 8th sieve and be caught on a 100th, mixed in proportions of three to one, whether the water would have any effect on it so that the whole of the dust is eliminated, and no dust left, only clean particles of crushed limestone that go through an 8th and would be caught by a 100th.

Mr. Shankland: I do not think the water would have any effect on it.

Mr. F.W. Barrett; If I may be allowed to make a remark I should like to do so, as I am interested in reintorced concrete construction. Our business of course, is in expanded metal and concrete, or reinforcing the concrete floor with the mesh of expanded metal. I quite agree with Mr. Shankland on the inadvisability of excessive spans. In a concrete floor, our own practice is to keep down to six to eight feet as long as we are allowed to do it. Sometimes we are forced to make longer spans, but it is against our will. Long spans have to be built with great care. In the instance mentioned by Mr. Shankland, where part of a concrete floor fell in an Apartment House in Chicago, the accident occurred during construction, and was supposed to have been caused by a workman removing the centering while the concrete was green and not thoroughly set. I cannot say that I altogether agree with Mr. Shankland on the lateral strength of the floors; I think if you consider a concrete floor, where the beams are encased in the concrete, although the main slab is just over the top of the beams, each beam is encased in the concrete, so that the concrete slab will form a very very stiff construction across the building from wall to wall; much stiffer than you will find in a floor where the spaces between the steel beams are filled in with separate blocks of terra-cotta. Then of course the consolidation of terra-cotta depends a great deal on the workmanship of the masons that are laying it; for, as you know, bricklayers are apt to leave a great many voids. On the other hand the concrete is laid in a plastic condition, and the beams are incorporated with the slab very largely. The result with the terra-cotta is that in place of a solid construction across the floor you have a number of joints; that is to say, each beam makes a complete separation from the adjoining slab; and if you have any settlement or special extensions or contractions on the part of your building you are going to take away the strength that it has in compression, and such a floor is going to be weaker than a monolithic concrete floor. We have tested concrete floors with our expanded metal construction and while a slab of 3½ inches thick may seem very thin, tests have been made on a slab of 5 feet in width where the joist beams were fastened to girders 12 to 14 feet apart; and on a slab of that construction a partially distributed load of 4,000 pounds to the square foot, and a total distributed load of one hundred and sixteen thousand pounds, was put on that panel, and it did not go through. Mr. Shankland says if you set a slab of concrete up on edge it has not much lateral strength; but I think it has more lateral strength than a slab of terra-cotta of the same size set up on edge; I know that, for I have tried it. We can put up a partition two inches thick and it is a good working partition, but if you put up a terra-cotta partition of double that you can push it over with your foot.

Mr. Denison: It depends upon the foot, doesn't it?

Mr. Barrett: I know we had to rebuild a lot of terra cotta partitions because they fell down in putting other work to them. Then again as to the fire-proof quality of concrete, as compared with terra-cotta blocks, I think Mr. Shankland may perhaps know of a fire in Pittsburg a few years ago in which two buildings were damaged by fire; one fire-proofed with reinforced concrete and the other with terra-cotta blocks; one building on each

side of the original fire. The building where the reinforced concrete floors were, stood the fire which burned out all the windows, doors and contents of the building on that side, but the floors were intact after the fire, and the repairs were made so quickly that inside of a month the building was reoccupied. The damage was to the superficial parts, the woodwork and that sort of thing. On the other hand the building fireproofed with terra-cotta blocks, on the other side, caught fire and it not only injured the floors but it absolutely destroyed them; the terra-cotta floors fell down though to the basement.

Mr. Duck: Was that hard tile or porous.

Mr. Barrett: I could not tell you.

Mr. Sbankland: You remember that the engineers that reported on those two fires sent in very diverse reports.

Mr. Barrett: Yes; the engineers at that time favored the concrete, and the architects the terra-cotta blocks.

Mr. Shankland: The city I think appointed three experts; I do not say they had three reports, but they had two.

Mr. Barrett: They had two; the engineers reported for the concrete, and the architects reported against it. Then the Schiller Theater in Chicago was subjected to a fire test, and the terra-cotta cracked and split and fell off very largely. On the other hand while we cannot recall many buildings giving tests of very severe fires on concrete construction, largely because I suppose the fire protection systems are so complete that they do not have very large fires and they are able to put them out; but there are no instances where buildings have been very seriously damaged. In Montreal recently there was a building where they had concrete walls, and a great deal of the other parts of the buildings were of wood; all this wooden construction burned out and subjected the concrete walls to a very hard test. It was a very hot fire, but the concrete stood it all without any damage and it is as perfect now as the day it was built. Tests have been made with small sections of the terra-cotta work and concrete; they have been subjected to an intense heat and made red hot. Teara-cotta blocks made red hot, then taken out and subjected to cold water will crack and be very seriously damaged; a cinder concrete block of the same dimensions put into the fire and heated red hot and taken out and subjected to cold water is very little affected.

Mr. Denison: This discussion reminds me of the rival safe agents after the Chicago fire who were calling upon a man who had been burned out. One said, "Do you know that when Jones' building was burned down all his papers were in one of our vaults and, when the fire was out, they opened the safe and what do you think?" The man said, I don't know; I suppose you are going to say the papers were intact." The agent said "More than that; there was a little banty cock in that safe, and when they opened the safe that cock jumped out and crowed." The other fellow says, "That is nothing; one of our safes was in a bigger fire than that, and when they opened the safe what do you think was in it?" "I suppose you had a banty cock that crowed too," said the other one. "No, he didn't," said No. 2, "There was a banty cock all right in the safe, but he was frozen stiff."

Mr. Jarvis: I should think that the concrete used for fire protection could not stand at all if it were made with crushed limestone or broken limestone, because the limestone under any great heat would calcine and you would have nothing but lime left. If it were made with crushed quartz or granite or some material of that kind it would be all right, but certainly not limestone.

Mr. Aylsworth: As concrete is used more and more for building walls, the question in my mind is what should be the proper treatment for the outside. I do not like the color of Portland cement and it will be necessary to treat the outside plaster with something. I would like your opinion on the question.

The President: I do not know whether you consider that within your province, Mr. Shankland.

Mr. Shankland: It is out of my line.

The President: If we have heckled Mr. Shankland as much as we can, I would like to put the vote of thanks which I have been asked to put. We are very much obliged to Mr. Shankland for coming here and standing this cross-examination; I think that when our proceedings are printed we shall find that we have got some valuable information, which will be of use to us in our work in the future.

It is moved by Mr. Wickson, seconded by Mr. Burke, that this Association pass a vote of thanks to Mr. Shankland for his kindness.

The vote was carried amid applause.

Mr. Shankland bowed his acknowledgments.

The President: Before the meeting adjourns I believe Mr. Symons has an addition to make to his report as Treasurer.

Mr. Symons: Since reporting to you yesterday in regard to the finances of our Association I have received the total sum of $461.20 that was outstanding for advertising in connection with our papers. This sum, added to that previously reported, makes our balance now in the neighborhood of over a thousand dollars. (Applause.)

It being 1 o'clock p.m. the meeting adjourned for lunch.

STONE WORKING BY MACHINERY.

A correspondent of "The Quarry" agrees with the opinion expressed by that journal that the successful working or otherwise of the wire-saw depends very largely on the constituents of the stone it has to cut, as it will work fairly well in one stone and be a total failure in the next. He says: "I have found these failures arise not only with wire-saws, but with other stone-working tools. I have been concerned lately in some experiments with pneumatically-driven chisels for stone dressing, and found them work well with many stones, but with some hard stones containing much silica they have been a failure. The stones I am alluding to are at present dressed by hand for paving, setts, etc., successfully, but when a pneumatic chisel, making some 1,000 strokes per minute, was used, it was a failure, as up to date I can get no steel to stand it, although I have tried samples from five leading English manufacturers; in all cases it turned up at the edge after a few minutes' use. After some 30 years' experience in this connection, I have come to the conclusion that stone conversion is rather a "tricky" thing, and every stone must be carefully judged on its merits.

FERRO-CONCRETE CONSTRUCTION.

At a recent meeting of the Society of Engineers, Mr. Augustus de Rohan Galbraith read a paper on the Hennebique system of Ferro-concrete construction. The Hennebique principle consists in embedding in concrete straight and cranked iron or steel tension bars and stirrups, to take the shearing stresses, together with distance pieces, the system being applicable to entire buildings from foundation to roof, inclusive. The piles used in the new dock works at Southampton, England, are built up in vertical moulds, in which are placed long steel rods, which give the required strength. These are laced together with wire stirrups, and Portland cement concrete of the best quality is filled into the moulds and rammed round the steel. After a month the pile is taken out of its mould and driven in position, much in the same way as timber piles are. The ram is exceptionally heavy, generally 30 cwt. The head of the pile is protected from injury by covering it with a helmet or iron case filled with sawdust.

The annual average cost of making absolutely necessary repairs to St. Paul's Cathedral, London, is $9,000, and it is estimated that $250,000 is necessary to put it in first-class condition and to make sure it's future.

NOVEL METHOD OF DEALING WITH STRIKES.

When the painters and decorators employed on the residence of Mrs. Herman Oelrichs, New York, fell out with the contractors and struck work, the lady waited a reasonable length of time for a settlement of the trouble, and then notified all concerned that if a settlement was not forthcoming within a week they would have no work there. They failed to come to time, so she employed carpenters and scrub women who worked under her personal direction. They tore down the scaffolds, put the paints and other articles in the street and put the rooms in order. And the painters and decorators are out to the extent of their interest in the work which she planned but has now deferred.

At the St. Louis World's Fair great fluted pillars 36 feet high and 4½ feet in diameter are now being made in a mold set in place, the liquid plaster being poured in at the top. Ordinarily such pillars are made in 24 pieces and set in place, leaving many joints that have to be carefully pointed. There will be 112 such columns on the Textiles Building.

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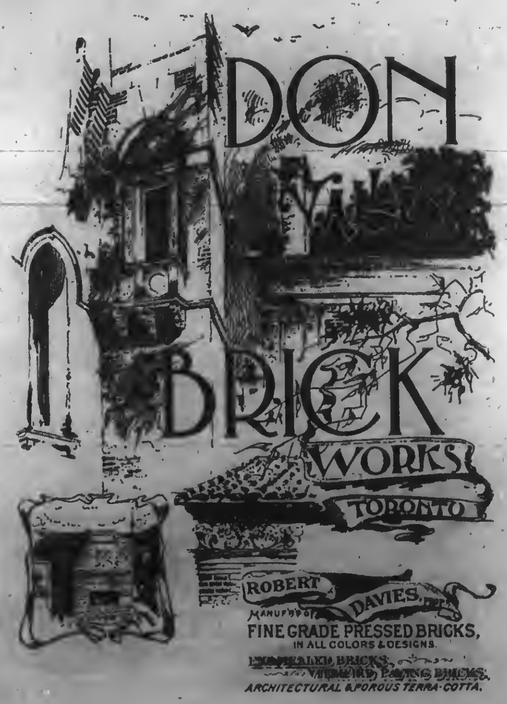

BUILDERS AS LUMBER DEALERS.

The builders and contractors of Columbus, Ohio, are going to establish a retail lumber yard. They announce that they have become tired of paying the exorbitant prices demanded by lumber dealers and now propose to become bealers themselves.

The American Lumberman comments on this decision as follows: "Let them get their yard well under way and they will learn sundry things. The lesson probably will be a costly one, but there are some people who cannot learn except by experience, and experience is always an efficient. though dear teacher. As they are not lumbermen, though more or less familiar with lumber, they will have to learn about sources of supply, how to chase up delinquent cars, how to estimate the fairy tales offered by lumber salesmen, how to unravel the intricacies of freight rates and rebates, how to get rid of 10,000 feet of lumber that they had to take in order to get the 1,000 feet that they had to have, and many other problems of like nature. They will probably hire a manager and that manager will have to be paid, and they will discover that running expenses and leakage will be fully as large as the personal salary and modest profit of the lumber dealers whom they are trying to supersede."

NOTES.

A new brick manufacturing company has secured possession of a large tract of land in the north-west section of Toronto and will at once commence the erection of a plant. About 100 or more men will be employed.

The Association of Canadian Portland Cement manufacturers has just been formed, the following being the officers: Chairman, J.M. Kilbourn, Lakefield: Vice-Chairman, F.G.B. Allen, Deseronto; Secretary, R. J. Younge; Executive, Messrs. Maitland, McLaughlin, Kilbourn and Kline of Owen Sound, Stanhope of Durham, Knechtel of Hanover, Elliot of Brantford, Morgan of Longue Point, Que., and C. A. Masten of Toronto.

The Plasterers' Section of the Builders' Exchange held their first Annual Dinner December 16th, 1902. An interesting feature of the proceedings was the presentation to their President, Mr. J.M. Gander, of a bronze clock and address. The Section has made great progress in the past year, having met and amicably settled all differences with employees, and are now working with the architects on a glossary of terms defining their work for specification purposes.

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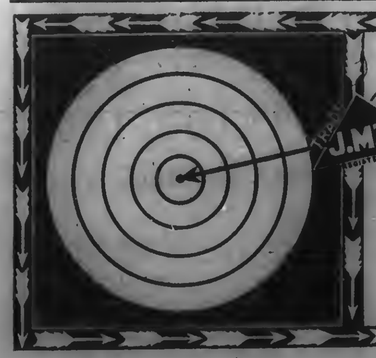

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BY THE WAY.

Among the restrictions which are being imposed by the city authorities of New York as safeguards against fire is one which prohibits after the beginning of this year the sale and use of parlor matches. Another regulation compels the use of fire-proofed wood in lofty structures, and large quantities of material called by this name have been rejected by the Building Commissioner as worthless.

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Mr. M. B. Aylsworth, a well-known Toronto architect, has recently returned from Port Arthur and Fort William, where he was engaged for four months in the erection of a hospital and other buildings. He states that building progress in these northern towns is only limited by the difficulty of securing workmen. Bricklayers are being paid $7 per day and labourers $2.50 per day. There are no vacant houses, and not enough mechanics to put up the new ones which the citizens wish to build. Each of the railways will be compelled to build at least one elevator every year for some time to come to provide necessary storage for the rapidly increasing supply of grain.

× × ×

In reply to an English draughtsman's enquiry as to the chances of employment in Canada, the Canadian Emigration Commissioner, in London, Mr. W. T. R. Preston, advised the young man that personal application would be necessary, and that the best time to come to Canada would be in the spring, when other employment could be secured if an opening should not present itself in the line of his usual employment. There never was a better time than the present for efficient architects' assistants to secure employment in Canada, and especially in Toronto. The demand far exceeds the supply, and competent young men in this line from Great Britain arriving here about March or April would be almost certain to secure immediate employment.

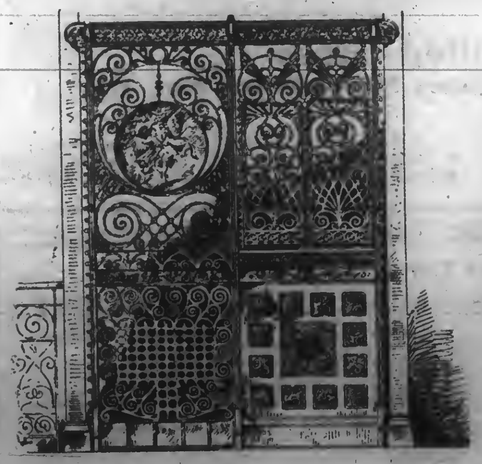
× × ×

The congregation of the West Presbyterian Church in New Westminster, B. C., find themselves in serious difficulty as the result of having misplaced their building. The board of managers agreed with the board of managers of St. Andrews' Presbyterian Church, that they would not build nearer than half a mile to that church. It has now transpired that the West Church stands 200 feet nearer St. Andrew's than the specified limit, and the Presbytery has been appealed to by the congregation whose territory has thus been invaded. That body after much debate has allowed the congregation of West Church five months in which to remove their building and thus fulfil their obligation. To do this will cost $1600, and as the church property is heavily mortgaged, this becomes a heavy burden. One is led to wonder what possible injury could result to the complainants from a mistake which placed a sister church 200 feet nearer to them.

"Alas for the rarity
of Christian Charity."

CANADA FOUNDRY COMPANY
LIMITED

Head Office and Works: TORONTO, ONT.



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FROM PHOTO AT TORONTO ARCHITECTURAL EIGHTEEN CLUB EXHIBITION

ALL SAINTS' CHURCH, DORCHESTER, MASS.

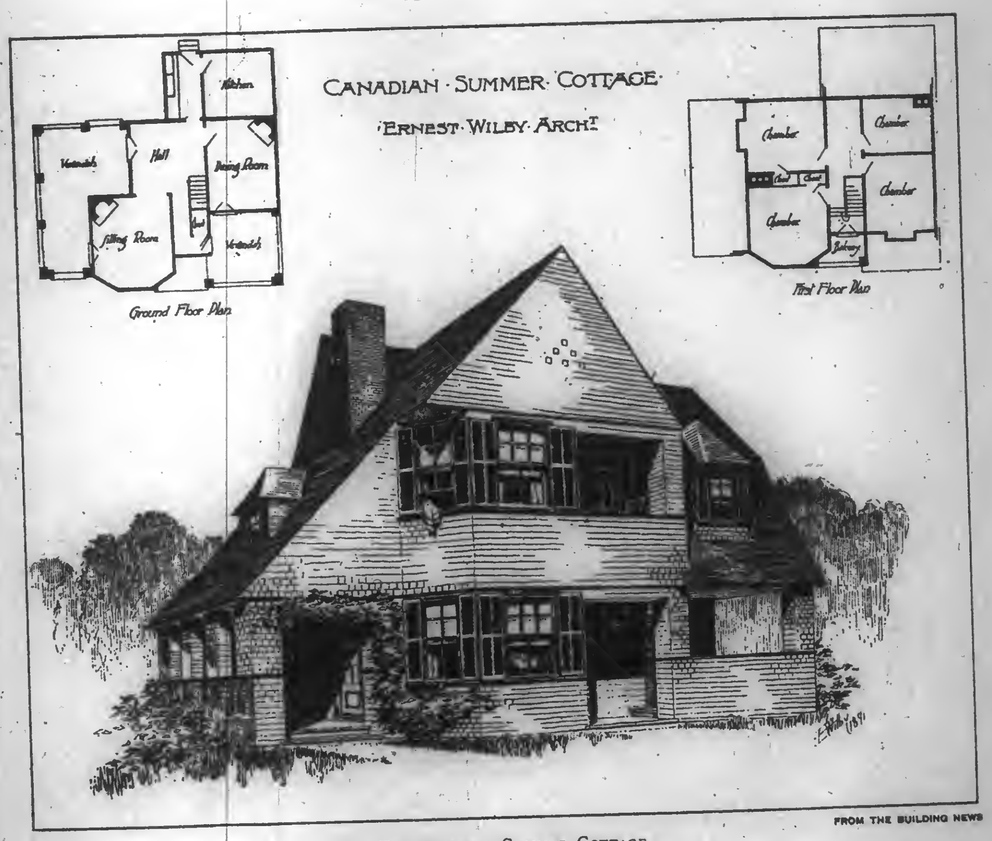
CRAM, GOODHUE & FERGUSON, ARCHITECTS.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
FEBRUARY, 1903

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
JANUARY, 1908

RESIDENCE, PARK ROAD, ROSEDALE, TORONTO.
BURKE & HORWOOD, ARCHITECTS.

CANADIAN ARCHITECT AND BUILDER.



DESIGN FOR A SUMMER COTTAGE.
ERNEST WILBY, ARCHITECT.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
JANUARY, 1908

CANADIAN ARCHITECT AND BUILDER.

The Canadian Architect and Builder

VOL. XVI.—No. 182. FEBRUARY, 1903.

ILLUSTRATIONS ON SHEETS.

House in Crescent Road, Rosedale, Toronto.—Gordon & Helliwell, Architects.
C. A. & B. Students' Competition for a Town or Suburban House.—Designs awarded First and Second positions, by "Canada" (Mr. A. A. King, Montreal), and "Pen" (Charles Wellington Smith, Toronto Junction, Ont.)

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Photogravure Plate—All Saints' Church, Dorchester, Mass.—Cram, Goodhue & Ferguson, Architects.
Photogravure Plate—The Benedicts of Beuron.—Friar Bonaventure and Friar Paulus.

CONTENTS

Editorial	25	Notes	41
Office Management	26-27	Northwest Letter	42-43
C. A. & B. Students' Competition	28	Publications	44
Materials, Methods and Terms used in Plastering	29-30	Business Notes	44
Design	31 to 38	Roman Stone	ix
Annual Convention P.Q.A.A.	39-40	Interlocking Rubber Tiling	x

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Sewage Disposal in Toronto.

The Toronto City Council have shown good sense by throwing out the recommendation of the Board of Control that the citizens should be asked to express by ballot their approval or disapproval of the proposal to install the septic tank system for the disposal of sewage. The City Engineer was sent to England last year to investigate sewage disposal methods. He has presented his report. If the Council have confidence in him they should act on his recommendations. If they have not full confidence in his judgment on this particular matter, let them appoint an expert to advise and act with him. What can the average citizen be expected to know about the merits or demerits of particular methods of sewage disposal for a large city? Let the Council and their officials deal with the problem and assume full responsibility for the resulting success or failure.

A Carnegie Library for Toronto.

The offer of $350,000 to Toronto with which to build a Public Library has brought on an acute attack of public debating upon the subject of Mr. Carnegie's grants. We can sympathize with the point of view of every one without seeing that it becomes the duty of the City Council to attitudinize in support of it or of any view but its own or what should be its own—whether or not it is for the interest of the citizens, as regards the question of having and maintaining a public library, to accept this grant and its conditions. Col. Denison may object to the intrusion of Americano-Scotchmen in the affairs of Canada; there is something noble and inspiring about this gentleman's stout Canadianism. Mr. E. R. Osler may consider Mr. Carnegie's offer impertinent; we are glad to have Mr. Osler take this stand, for it is certainly pertinent that the exceptionally wealthy should begin in Toronto that practice of endowing public institutions which is doing so much good in the cities of the United States; and Mr. Osler, who is liberal himself, is just the man to introduce into wealthy circles in Toronto the idea that one of the privileges of wealth is the endowment of beneficent and educational institutions. The Toronto District Labour Council may "protest against the acceptance of any alms or contribution . . . as an easement to the conscience of this man . . . who imported into the Town of Homestead a gang of sluggers, known as United States deputy marshals, whose presence resulted in the loss of life of our brother workers"—who were out on strike in July, 1892. This too is an interesting demonstration, marking the progress of thought in these matters; but it is not the function of the City Council to discuss Mr. Carnegie's wealth, only the portion of it which he offers for their use:—whether it is enough for the purpose and whether the accompanying obligation is too great to undertake as a consequence of acceptance.

The interesting questions really are whether the money—from which a large subtraction must be made

for building a branch library—is enough; and where the building should be placed. The money is certainly enough to make any addition to it a light matter and the pertinent question for the City Council seems to be whether they would rather provide the whole amount or the small part that it may be necessary to raise to supplement Mr. Carnegie's grant. It is only a library that is wanted. It is not necessary to aim at the general purpose arrangement which spoils so many libraries and adds unnecessarily to their cost—combining an art gallery, museum, etc. The project of an art gallery has already been under consideration in private circles and there is some prospect of its being built under auspices that will insure its being a good thing.

As to the question of site—it seems obvious that the central public library should be down town, where most of the population collects during the day. Between those who work daily in the city and those who come in to shop, to attend the theatre matinee, etc, the city proper is frequented, during a week, by nearly the whole population, and there is no other part which is. People live at opposite ends of the city and pass through the central part on the fly on their way to and from the business part, what we have called the city proper, or what is usually called "town." It is in town therefore that the central public library should be placed; for it is only there that the business part of the population, who work in town from early to late, would have a chance to visit it at all; and it is only there that the part of the population, whose daily occupation is domestic, could include the public library in their town round instead of being obliged to make a special visit to it at the cost of more time and an extra street car fare.

Mr. William L. Symons,
President Ontario Association of Architects, 1903.

If the building is to be down town the site does not seem difficult to choose. There is plenty of room vis-a-vis of the City Hall, and the buildings to be removed are unimportant; the situation is probably the most convenient that could be chosen, and the conjunction with the City Hall, like the conjunction of a planet with the moon, will give greater importance to each. It is a pity that the site adjacent to the City Hall on the north side of the street has been occupied by a private building. Here, in the sunlight, where its retirement from the road would have increased the space about the City Hall, was the site for another public building; but there is a sunlit corner still available on the east side of Bay street, and there the Public Library should be placed.

OFFICE MANAGEMENT.

(Concluded.)

Memo Record—The satisfaction of getting notes down in writing is apt to be delusive unless there is a certainty of the notes being forthcoming when wanted. A scribble book for all notes, dated at the beginning of every day, does very well in a small office, but as soon as the office rises above one man power and there must be more than one scribble book, it becomes evident again that the only way to provide for expansion is to keep everything together that refers to each piece of work. In the case of notes of all kinds the simplest plan is to keep a scrap book for each job into which shall be pasted every note that is made in connection with it. A standard size of note pad, distributed through the office and ready to every one's hand, will produce neater and more orderly results. Should a client come in with instructions the first thing is to date a sheet of the scribble pad. When he is gone the notes should be pasted in at once, both for security and also to keep everything in order of date.

Call Book. — The office boy should keep a book on his desk in which to enter under date the name of every one who calls on business of the office and whom he saw. The time of coming and going should be entered. In the case of a client it may be useful to exhibit in support of an account a statement of the number of hours of office time consumed in interviews.

Extras. — Here is a great centre of trouble in building, not always on account of the amount of the extras so much as because they are unexpected or incurred without permission. It seems to be commonly held among architects that extras should be kept in the background as long as possible. If this is intended to further the maintenance of smooth relations with the client as long as possible, it is a mistake, ministering only to a deceitful smoothness which must react upon the architect's mind and effectually destroy the frankness that ought to be the essential condition of his dealings with his client. If a statement of extras is delayed in the hope of reducing them in some way before the day of settlement, the path is made easy for temptation to juggle with the extras and the contract to drop some item of the contract in payment of extras, or to substitute a cheaper material for a dearer, and set off the amount of the difference against the extra account before making the statement of extras. Either of these methods of reducing the extra bill may be a judicious decision, and cheerfully accepted by the owner; but to make them without his knowledge is an act which bears a strong symptomatic resemblance to dishonesty; for the contract which the owner has accepted states the work which he has a right to expect unless he agrees to deduction from it.

The wisest plan is to keep the statement of extras as far as possible abreast of the progress certificates. For this purpose as well as to avoid disputes it is well to settle the amount of the extra, as far as possible, when it is ordered, and to give all orders for extras in writing stating the estimated cost. For this purpose a form is necessary, printed with headings for the building number, order number, date, contract, description of work to be done (with plenty of space left for this) the cost, and signatures of contractor, owner and architect. The form should be issued in triplicate, and it would be best to have it in book form with one stub for each three blanks. If there is to be but one writing with carbon paper between the blanks, this would require a page with three divisions perforated between and printed alternately on the front and back of the page, so that the printed surface of all three may face upwards when they are folded for reduplicate writing. The three blanks should have "owners' copy," "contractor's copy," "architect's copy" printed across the face.

Contracts.—The contract should be made out in triplicate; a copy each for owner, contractor and architect, and the office copy should have attached to it the tender and memoranda to show how the contract sum was made up.

A set of blue prints, as less susceptible of alteration, is usually set aside for the signed contract drawings. Subsequent alterations may be then made on the tracings and should always be dated. A print of each alteration may be made.

Certificates and their Record.—The certificate form should have headings on the stub for a full statement of the progress of the account and these should be repeated on the certificate. The items should run: Contract amount, extras, total, deductions, net total, (thus taking account of extras and deductions to date of issue of certificate) former certificates, this certificate, drawback, total, and balance on hand (when total of certificates and drawback is subtracted from the net total above.) The drawback and balance do not seem to be inserted in the American certificate. The building number and progress and trade numbers of certificate should be given and the date; the name and address of the owner or his agent to whom the certificate is addressed and the contractor's name. All information on the face of the certificate should be entered on the stub. It seems to be usual in American offices, to have only a brief note of number, date, amount and contractor on the stub, but to keep a letter press copy of the certificate, and the form is sometimes printed in aniline ink for the purpose.

Frank Miles Day & Bros. print on their certificates the following excellent notice:—

"On making this payment the owner should assure himself that his interests are protected by insurance sufficient to cover his liability in the increased amount resulting from this payment."

This notice is supplemented by a note to the same effect, on a form added to the certificate with a perforated attachment. It reads thus (after number, date and address):—

"We have this day issued to.....a certificate of payment on account of.....contract for work on your.....We call your attention to the insurance clause of your contract and to the notice as to insurance on the certificate.

Yours Truly

.....

For the record of certificates and contract accounts, the writer in the The Brickbuilder recommends a folder for each contract. Copies of contracts, orders and accepted estimates are kept together in the respective folders. These documents are apparently fastened on the inside. The record of accounts are made on the outside and are displayed at one opening, thus:—The sheet, which is in the proportion of 3 long to 4 wide, is folded vertically in three; the middle division which is to be exposed, is titled with the building number, the contract, contractor's address, etc., the side divisions have recorded on one the certificates issued, with columns for date, amount and total to date, on the other a statement of deductions and extras in four columns under four headings, viz., date, order number, deduction, extra. The deductions and extras in parallel columns show at once the progress of the extra account. The bunch of folders having to do with one building are kept together in a special file. As an assistance to picking out the right folder with ease, the tail of the outside fold may have printed on it a list of all trades, and the trade accounted for by each particular folder may be underlined.

It is worth notice also, in pursuance of the idea that printed headings for everything that should be filled in are a necessary guide to prompt the memory of office subordinates as to method and ensure orderly work, that across the head of the exposed surface of the contract folder is printed "file herein contracts, accepted bids and orders."

Superintendence Reports:—In a large office where superintendence is done by an outside man or a draughtsman, a form of superintendent's report is essential, but even when a principal oversees the work, it is desirable to keep a record of progress, and to keep a reminder of work not done according to contract that it may not be lost sight of until corrected. The form in use by A. J. Manning serves both as an instruction to an unskilled superintendent and as a reminder to an experienced man. It has the following heads with space sufficient after each for the sort of note that follows:—

"Weather conditions....How much time lost owing to bad weather....Number of men at work....What doing....Work done since last report....Work not according to contract....Defective work formerly reported made good and how....Materials delivered since last report....Materials wanted on the work now....Materials not on the ground that will be required two weeks hence....Mechanics wanted on the work....Mechanics that will be needed two weeks from this inspection....If work is delayed or will be delayed for want of materials, details or other reason, state for what, and include any remarks not covered by above inquiries"....

If this form or one to the same purpose is filled in periodically the work is not only more methodically looked after but there is a continuous record on file of the progress of the work.

Work Slip.—A convenient device to keep work moving with little personal oversight is the workslip. The following heads for entry are taken from a slip in use in the office of George B. Post. After the building heading and slip number are as follows:

"Title of work....Origin and date....Drawings ready....Drawings submitted....Drawings approved....Specification ready....Contractors affected....Estimate invited....Estimate ready....Estimate Submitted....Work authorized....Contract awarded or orders issued"....

When the last item is dated the slip may be filed away. The "origin" may be the Memo Record, the authorization a letter. A rubber stamp for such constant authorities will be found useful; in particular a rubber stamp, lettered "vide letter....19....," will be found of great service for marking, authorization or directions on drawings, records, reports, work slips, etc.

"C. A. & B." STUDENTS' COMPETITION.

The committee of award in the CANADIAN ARCHITECT AND BUILDER'S Students' Competition for a $2,500 town or suburban house, have awarded first place to the design by "Canada," second place to the design by "Pen," third place to the design by "Mayfield," and honorable mention to the design by "T Square, Jr." The judges submit as a part of their report the following criticisms of the several drawings :

"CANADA" (design placed first)—The front would be much improved by designing the main gable more in scale with the rest of the work. The designer has not sufficiently studied the effect of the lines of the semi-circular gable above the rafter lines of the roof. The effect in execution would be even more clumsy than on the drawing.

In regard to the plan, pantry accommodation should have been provided and connection from the kitchen to the dining room without having to go through the main hall. The bathroom is too small. The sub-dividing of the basement should have been shown.

"PEN" (design placed second) has won his position in this competition not so much by what he actually presents as by the possibilities of his design.

In the first place the drafting is very incomplete, particularly in the planning ; while the lettering is unnecessarily large and very ragged.

He certainly should have indicated more clearly than he does the steps approaching the entrances ; also the wall section on the front elevation is entirely out of place, hindering the completion of the side elevation of the dining room extension, which is far more important than the wall section.

In the plan there seems no reason why the staircase hall should be shut off from the entry hall in the manner it is; nor why the bed room over the dining room should be practically entered through a closet.

The stairs would have extremely high risers indeed to reach the first floor in the space allotted to them, but however there is no doubt space enough in the hall to permit of them being made adequate.

The principal charm of "Pen's" design is the quiet and thoroughly domesticated character of the elevations, which are rather weakly rendered, but are entirely free from over-strained or exotic features, and had it been more carefully worked out in plan and also more carefully rendered in elevation, it would have been more worthy of the design, which is quite charming and capable of being put into very effective shape.

MAYFIELD (placed third).—This design shows a large amount of restraint; is simple in plan and the draughtsmanship is good. As regards the plan, the direct entrance to both the dining room and hall from the kitchen would be undesirable. This could have been obviated by moving the kitchen more to the north, and by placing a pantry and small hallway on the south side of kitchen, the pantry to project over dining room with serving door on west side of dining room. The servants' room would then be reduced in size but with closet in north west corner it would be ample. It might be said that most clients would object to a servants' bedroom opening off the kitchen. In the ground floor a door should connect the dining room and front hall. The exterior design while plain, is original in conception. The barge board seems a little heavy and the method of projecting the ridge board is hardly commendable.

"T SQUARE JR." (Honorable mention)—This design calls for great commendation, but is open to the insurmountable objection that the cost would far exceed the amount allotted, and so was ruled out of consideration as a prize winner.

The ground floor plan is excellent, and the Pergola introduced is at once unusual and suitable.

In the first floor the objection to be noted is that inferior rooms such as w.c., linen closet and cupboards, in addition to the bathroom, take up the south front of the house, while a bed room is placed facing north.

The elevations are extremely well handled, both as to design and rendering. The general composition is good, materials properly used, and the character is both reserved and interesting.

The details submitted show careful study and skill in obtaining a good result by simple means.

"UTILITY."—This design shows careful study and aptitude in planning, design and rendering, but, as in the case with "T Square Jr.," the cost would far exceed the stipulated amount.

One feels in regard to the ground floor that more advantage might have been taken of the south aspect.

In the first floor plan the exposure has been more considered, and altogether the arrangement is good.

The elevations are well rendered and the design on the whole is satisfactory, although better results would have been obtained if more distinct character had been aimed at.

"BOBS."—This design could not be built for the amount stipulated in the conditions.

For the size of the rooms the hall area is too great and there is much waste of space on the first floor wing, the bath-room being unnecessarily large and the bedroom cupboard out of proportion to the size of the room, and the linen closet inconveniently arranged off the bathroom.

The main outlines of the elevations are good. Much of the effect thus gained has been lost in striving after effect by detail, as for instance, in the chimneys.

The verandah is especially weak in design.

The interior details are good. The design for the front entrance door is bad.

"MULTUM IN PARVO."—The plan and elevations on the whole are good but commonplace. There has been too much striving for effect in the main hall, ground floor. If more room could not have been obtained it would have been better to omit the fireplace and to have formed a vestibule, doing away with useless small closets, and possibly the beams and column. The plans and perspective are neatly executed.

"CYMA"—The author of this design has evidently made a conscientious effort to plan an everyday house to suit the average householder—but a greater effort might have been made to improve upon the ordinary run. The position of the pantry between the kitchen and front hall is objectionable and it would have been better to have used this space for a back hall and rear staircase, placing the pantry and a cupboard on the south side of kitchen. Upstairs, such an arrangement would allow the bathroom to be put on the north-west corner, with better light. The stairs to attic as shown, over rear stairs, give little headroom, a matter of vital importance in planning. The alcoves off the parlour and main bed-room might be made pleasing features, but the proportions of these rooms are not of the best. The single sliding door between parlour and dining room is too large for practical purposes. As regards the exterior, the gable over the square bay requires support at north-east corner for appearance sake and the pediments of verandah roof are unsatisfactory without breaks in cornice line to give them a meaning, For the front door and side light a more symmetrical arrangement would have been desirable.

"IF"—This design shows a plan of a character well suited for a suburban or town house, but a vestibule is an essential in a climate like ours, for which it is assumed the house is intended, and this could easily be arranged. In the dining room the fireplace might have been omitted and the space provided for a side-board. The first floor plan is good but would have been improved, if at least two of the bedrooms opened off the front hall. The perspective drawing is certainly distorted and hardly gives the correct impression. The large gable in front and short ridge from front to back would look out of proportion if correctly drawn and it would have been better to have omitted the more easterly of the two gables on the north side. The finish of octagonal bay, etc., under the overhanging part of first floor as shown looks crude. On the whole with a little more study of the elevations a much more satisfactory design might have been evolved. The two mantels shown are rather weak as to design, and the drawing does not give a proper indication of the material or construction. The draughtsmanship generally is commendable and the lettering is neat excepting in the floor plans.

"MAPLE."—The plan of this house is one of the best, being compact with space well utilized and careful attention given to the disposition of rooms, aspect, etc. The dining room with eastern exposure is well placed and the finishing of the first floor hall in bay to the west is satisfactory, thus allowing space for two good bedrooms to the front. The cutting of the corner of the south east bedroom might have been avoided, as it is almost always an undesirable feature in a room. The exterior massing is good, but the detail is somewhat mechanical. The two small circular bays to the south are rather trivial and the half timbered spandril over verandah, finishing against the brick wall is a feature which would be unsatisfactory in execution.

(Signed),

W. L. SYMONS
A. F. WICKSON
WM. RAE
J. P. HYNES
A. H. GREGG
} Committee

[NOTE.—The names and addresses of the successful competitors are as follows:—"Canada" (awarded first position) Mr. A. A. King, 73 McGill College Avenue, Montreal ; "Pen" (awarded second position) Mr. Charles Welsington Smith, Jane Street, Toronto Junction, Ont.; "Mayfield" (awarded third position) Mr. George C. Egg, 24 Tupper Street, Montreal ; "T Square Jr." (honorable mention) Clarence Thetford, with Messrs Darling & Pearson, Imperial Bank Building, Toronto.—EDITOR C. A. & B.]

MATERIALS, METHODS AND TERMS USED IN PLASTERING.

At the request of the Toronto Chapter of the Ontario Association of Architects, Mr. W. J. Hynes, on behalf of the Plasterers' Section of the Toronto Builders' Exchange, has prepared and submitted the following description of materials, methods, tools and trade definitions used in plastering, the object being to assist in bringing into use specifications that shall be more nearly uniform than those heretofore employed :

DESCRIPTION OF MATERIALS USED IN PLASTERING.

1. No. 1 WOOD LATH consists of white pine, cedar or spruce, free from large knots or bark, 3/8" thick, 4 feet long, in widths of 1", 1¼" and 1⅜", of uniform dimensions.

2. No. 2 WOOD LATH consists of hemlock, hard pine and culls from white pine, cedar or spruce, of irregular dimensions.

3. EXPANDED METAL LATH made from sheet steel, cut and expanded, may be procured either in the naked steel or painted. The Expanded Metal Company, of Toronto, manufacturers.

4. HAYES' METAL LATHING is made from sheet steel which is perforated, with the points of perforations turned back to form keys. Manufactured by the Metallic Roofing Co., Toronto, either plain or painted.

For either metal lathing the bearings require to be not more than 12" centres.

5. GREY LIME from Georgetown, Limehouse and Milton is generally used for mortar for the under coats in plastering. It should be well burned and used while fresh.

6. WHITE LIME from Guelph, Galt, Innerkip and other places is used for the finishing coat. Like the grey lime it requires to be well burned and should be made into lime putty while fresh.

7. WHITE ROCK FINISH, a new preparation on the market appeals strongly for consideration, from the fact of its being scientifically ground, and slacked with only sufficient water to complete the slacking, leaving the product in the form of dry powder which can be conveniently handled and used same as lime putty. Manufactured by the Imperial Plaster Co., Toronto. To be used according to the directions of manufacturers.

8. PLASTER—Made from Gypsum requires to be finely ground and properly calcined. Should be white in color, and of uniform setting properties. Our market is chiefly supplied by the Albert Manufacturing Co., of Hillsborough, N. B.

9. SAND for lime mortar should be sharp and clean but not too coarse ; for cement work, coarse sand is best.

10. HAIR should be long winter cattle or goat hair properly saved.

11. FIBRES have been offered as substitutes for hair, but nothing at present offered answers the purpose.

12. NAILS for wood lathing 1⅜" long, of good weight and head. For expanded metal large-headed slater's nails. For Hayes' lathing heavy lath of good head.

13. METAL ANGLES. Hoidge metal angles patented and manufactured here are a good protection for external angles.

14. HAIR MORTAR consists of grey lime properly slacked and mixed with clean sharp sand, to which is added sufficient hair to hold the material from falling or wasting through keys of lathwork.

15. STRAIGHTENING MORTAR made same as above with a greater quantity of sand and one third the quantity of hair.

16. COARSE STUCCO made from grey lime, or white, as desired, with clean coarse sand.

17. FINE STUCCO made from lime putty or white rock finish, mixed generally one of lime to three of clean sharp sand.

18. LIME PUTTY made from white lime slacked with a surplus of water, run through a fine sieve, and allowed to stand in vats until fit for use.

19. GAUGING is the term used to describe the admixture of calcined plaster with mortar or lime putty. The larger the proportion of plaster used the stronger the work will be. The same term is used to describe the mixing of cements with mortar, sand, lime or other material.

20. PORTLAND CEMENT gauged with lime mortar is used generally for outside work and first coat on lath work, the proportion varying according to requirements.

21. PORTLAND CEMENT STUCCO generally used for outside work and places subject to damp or moisture. when applied on lath, use one of Portland, three of sand, and add one of hair mortar. Second coat, three of sand, one of Portland, and finishing coat generally two of Portland to five of sharp sand. When used on lathing, metal lath is to be preferred.

22. PORTLAND CEMENT WORK is generally conceded to be the best base coating for Keene's or white cements.

23. KEENE'S, PARIAN, MARTIN'S generally described as "white cements," were originally patented. The base of all is gypsum mixed with alum or borax and recalcined and ground. English Keene's cement is generally made in three grades—coarse, fine and superfine—the first of a pink shade and the latter pure white.

24. FOR BASE COATS Portland cement work is generally used, but many manufacturers advocate the use of coarse Keene's and sand. This method requires that the heads of all lath nails and exposed metal work be well shellacked to avoid rust. For first coat use two coarse Keene's, three sand. For second coat use one of coarse Keene's, one sand. Finish with neat cement.

25. VICTORIA KEENE'S CEMENT manufactured in England by Cafferata & Co. allows the use of lime in small proportions. This greatly reduces the cost, not so much in the material as in the ease and speed with which work may be executed.

26. BEST'S AMERICAN KEENE'S also uses this method for plastering.

In specifying these materials it is advisable to say they shall be used as directed by the manufacturers.

27. PATENT OR HARD PLASTERS are numerous. The base of nearly all is calcined plaster mixed with sand, cement, hair or fibre, and treated with a chemical retarder which delays setting and allows time for use. They are generally good, being machine made of ac-

curate proportions and furnished at building ready for use with the addition of water only. To save cost of transportation, some are delivered ready to use by mixing with sand and water. Owing to the increased cost of this material, thinner grounds are used.

28. WOOD FIBRE PLASTER made in Toronto by the Imperial Plaster Co. is the best and most general in use here. It is supplied ready for use by adding water only.

29. PARISTONE made by the Alabastine Co., Paris, Ont., is supplied without sand and contains no hair or fibre.

30. ROCK WALL PLASTER made by the Albert Manufacturing Co., Hillsborough, N.B., is supplied without sand.

It is advisable to specify these materials to be used as directed by the manufacturers.

31. PATENT OR HARD PLASTERS make only the base or rough coats. Good stucco or float finish work may be done with them but all depend upon lime putty or white rock finish for a trowelled coat.

33. BLACKBOARDS. — Potter's Blackboard Material made by the Soapstone Finish Co., Chester Depot, Vt., is generally used. Some contractors have their own compounds and methods. They should be black, hard, smooth, but free from shine or polish.

DESCRIPTION OF WORK DONE IN PLASTERING.

1. RENDERING is a good coat of hair mortar on brick or stone walls before lathing.

2. BACK PLASTERING is lathing and plastering with one good coat of hair mortar on any framework which may be required before regular lathing is done. Back plastering, when done between timbers, is a slow and expensive process. It is better to lath and plaster the timbers and re-strap lath and plaster, as this method gives complete separation of woodwork.

3. DEAFENING is a body of plastic material laid on boards fixed between joists of a floor, composed of lime screenings and cinder or ashes, or lime and mill shavings, about 2″ thick. The use of cement in deafening is a detriment, as when made hard the deafening properties are destroyed.

4. WOOD LATHING should have joints broken every twelfth lath nailed 3-8″ apart for ceiling work and ¼″ apart for wall work. Ends butted, no vertical lath allowed.

5. METAL LATH should have bearing, not exceeding 12″ centres nailed on with flat headed nails for either metallic lath or expanded metal and if finishing coat is required must be specified "three coat work" as all metal lath must receive a scratch coat foundation for straightening. Arches, grains, or furring for heavy mouldings are best executed with metal lath.

6. ONE COAT WORK is one good coat of hair mortar or other plaster about ¼″ thick and floated to to an even surface.

7. TWO COAT WORK is one good coat of hair mortar straightened with a tool called a "darby" and floated. After this coat is dry apply putty coat of white lime and plaster with sand, if desired. The work cannot be made more than reasonably straight.

8. THREE COAT WORK is one good coat of hair mortar well scratched. Second coat of straightening mortar laid plumb and true. After this coat is dry apply coat of white lime and plaster with a mixture of sand, if desired and extra well trowelled or polished.

9. ROUGHCASTING is a good coat of hair mortar left from the "darby," and when dry slapdashed with a mixture of lime and clean fine gravel.

10. STUCCO—this term is used to describe plastering work finished with a wooden tool or float leaving a rough granular finish.

11. Rough or two coat stucco work consists of one coat of hair mortar well scratched and finished with coarse stucco applied when under coat is dry, straightened with a "darby" and brought to a rough uniform surface. This work cannot be expected to be more than reasonably straight.

12. Three coat stucco or float finish consists of one coat of hair mortar well scratched with a second coat of straightening mortar laid plumb and true and finished with a coat of fine stucco properly floated to uniform grrnular surface.

13. BASTARD STUCCO consists of work executed as described for three coat work with the exception of the last coat being composed of two parts lime putty to three of sand laid true and floated to an even surface; this is then trowelled to a hard surface but the face is not made perfectly smooth.

14. TROWELLED STUCCO is same in material and method as bastard stucco, the difference being that it is trowelled until face is brought to a true smooth surface. In both bastard and trowelled stucco the under coats must be thoroughly dry; there being no plaster or cement used in this work the success depends upon proper and uniform suction.

15. DUBBING OUT is the term given for the necessary work in preparing the uneven surface of rough brickwork or fireproofing to allow of plastering. If done with mortar it will require that not more than ½″ be put on at one time and may take several coatings to bring work to the proper surface. By using gauged mortar or hard plaster the necessary thickness may be applied at one operation.

16. PORTTAND CEMENT WORK requires same methods for stucco work as here described for mortar, the proportion of materials being as described in Materials, clauses 20 and 21.

17. TROWELLED PORTLAND CEMENT requires under coats, as described above, and is finished with two of Portland, one of fine, sharp sand, to which is added one twelfth of fine lime putty, laid even and trowelled to a fine polished surface.

18. KEENE'S CEMENT WORK may be finished as described for plastering work, the proportions being as described in Materials, clauses 23, 24, 25 and 26.

19. PLASTER MOULDINGS are formed with gauged mortar and finished with gauged putty. When weight of mouldings is not too great the mortar may be dispensed with. Owing to the danger from settlements and shrinkages the thickness of these mouldings should not exceed 1½″ in any place. All heavier work requires to be bracketed.

20. KEENE'S CEMENT MOULDINGS are executed in neat Keene's cement, either coarse or superfine as may be desired, with a backing of coarse Keene's and sharp sand.

21. PLASTER CASTINGS are composed of plaster and cast from moulds required by the design or article to be duplicated.

22. STAFF CASTINGS are composed principally of plaster to which fibre or canvas has been added before the plaster has set. Their cost is no greater than for the plaster castings and they are much stronger allowing of very large work to be made in one piece. These casts may be sawn and fixed by nailing.

STAFF calls for special attention. There is no limit to its possibilities as a decorative material either in conjunction with run mouldings for enriched members or for the production of mouldings with enriched members and decorative features complete. By its use the entire decoration may be prepared while the building is in course of erection, ready to fix as soon as work is ready to receive it, in this way saving much valuable time. The manufacturers carry full stock of such ornaments as are in general demand but work to detail requires special models, for which due time should be allowed. Specifications should state whether work is to be from stock or specially modelled to detail.

23. WOOD FIBRE PLASTER or other hard plaster may be specified for any work where mortar is used for interior, as described in previous clauses. A great saving in time can be effected by its use, particularly in winter or damp weather.

24. TOOLS AND TERMS.—Scratching is the term used to describe the cross scoring of the first coat of mortar to form key for straightening coat or coarse stucco finish.

THE DARBY is a wooden tool about three feet long, 4″ wide and ½″ thick, with two handles by means of which the first coat is two coat work, and stucco coat in two coat stucco is levelled or roughly straightened.

THE FLOAT is a wooden tool about 14″ long, 4″ wide and ⅜″ thick, used after the "darby" and straightening rod to level out the work, also for finishing stucco work.

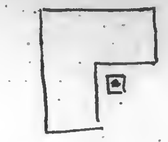
25. GROUNDS for plastering work should be of soft pine firmly nailed and made true and straight. The thickness of grounds determines the widths of frames and jambs and should be considered together. For brickwork or terra cotta the thickness here given is supposed to be fixed close to wall; if unduly packed out to straighten defective walls a dubbing out coat is necessary.

Two coat work in lime mortar on lath ¾″ grounds.
" " " " " brick 3/8″ "
Three coat work in lime mortar on lath 7/8″ "
" " " " " brick ⅝″ "
Grounds for metal lathing ¾″.
Two coat work hard plaster on lath ⅝″ grounds.
" " " brick ⅜″ "

DESIGN.*

By WILLIAM L. PRICE, Philadelphia.

Mr. President, brother architects, and friends of architecture. I have not any paper to offer you, just a few remarks that I am afraid will be rather rambling because I want to touch on a great many subjects; I want first to speak on the question of making the talk a practical talk. We have heard a great deal of discussion to-day at dinner and at other times about being practical but every time we try to be practical we turn to the ideal, because when we come to analyze what is ordinarily called the practical it is the transitory; it is the bread and butter that we eat, not for its own sake, but to make the man; the practical part of our work is only the mother of the ideal. Architecture could not exist, architects would be an absurdity if it were not that the ideal is after all the main object of mankind's search and endeavor. Now it so happens that architects are not only clothiers of mankind, but teachers of mankind, teachers for good or ill; teachers whether they want to be or no. Now I do not know of any royal road to the ideal, if I did I would not tell anybody about it, because the only thing that any man can get to help him towards the ideal comes from within and not from without. We spin our own cocoons (especially as architects) and it lies with us whether our cocoon shall be a monument or merely a sepulchre. And we must not compare those cocoons one with the other and say of this man that his cocoon is not as fine a monument as the other man's. Compare it with the man himself and ask, Did he build as well as he knew, or didn't he? That is the only question. If he built as well as he knew he couldn't help building to himself a monument and for the crowd a betterment. The architect's profession or art or whatever you choose to call it, is perhaps the most involved that there is. We have just been discussing a question of color decoration; the architect that does not consider the question of color in his buildings when he is designing his mouldings and ornaments is not designing at all. It is just as much an essential part of the design, the color of the walls or an approximate idea of the color of the walls as the moulding; they are there for the same reason, to give color effects, light and shade. One of our architects some years ago denounced American architecture as "an attempt to make something look like something else that would not be desirable if genuine." That is a pretty savage arraignment, and it is perhaps not quite so true as it was; but still it is in a large measure the truth. When we build the big structures that we call buildings, office buildings or similar buildings (they are not buildings at all in the real sense, but are structures or erections), we clothe them carefully with building material, nine times out of ten, stick it on, bolt it on. There is a building in Philadelphia in which the granite corner piers, a perfect absurdity in itself, are apparently of solid blocks, carefully and painfully cut out in the form of an "L," allowing the column to stand within it in this fashion.



1

If that is not an attempt to make something look like something else that would not be desirable if it was genuine, I do not know what it is. It is a lie that works both ways; it hurts the community and it hurts the man who did it, and hurts him worst.

Much of what I am going to say may appear reactionary, but I want you to notice one thing, that the man lost in the wilderness (and we are just a little lost in the wilderness in art matters), if he has not some guiding point, will go around in a circle—at least I am so told. So while the line of progress may be something like that—an upward slope—we may be travelling

2

a line something like that, believing all the while that we are on an upward course.

And we must not measure the line by what we can see of it; we do not see enough to make one part of it look different from another part at any time. We have to consider a great many outside things; to look at history and experience, to the architect especially that is essential. There is only one thing worse, in my judgment, than ignoring precedent, and that is following it. (Applause and laughter.)

Now I want to take you with me in a little practical talk—we are up against a serious proposition. Having secured our client, the first question for us, what next? Shall we build around that client our shell or his fitting shell? Now when we stop to think of it, how often are we trying to build the best possible monument to ourselves and not the best possible house or building for that man?

During a first interview with a client a year or more ago, after talking to him about an hour, he said, I would like to see the house you would design for me, Mr. Price, and I said I would too. Being agreed on that he then said: "Now I have told you the things that I want, the size of the rooms and the number of them; you know

* Paper read at the annual convention of the Ontario Association of Architects held in Toronto January 13th and 14th, 1903.

the site, make me a sketch of the house you think will fit these requirements." I said, "Mr. ——, I will gladly do that; I can do that, I think, but if you take that design and build it you will be a fool." And then I went on to say, "for I do not know you well enough to draw a house for you." I hadn't the slightest expectation that I would get that job, but right there I got it, because that man began to see something different in architecture from what he had ever seen before; he began to realize that this was to be his house, not an architect's house merely. Afterwards, sure enough, to show you how the good work took effect, one of the leading finishers of the city went to him and said, "Mr. ——, you are a busy man, you donjt want to bother with the designs for the inside of your house; I will refer you to So and So—we did the work for him—$47,000 worth of interior work and we did not take up two hours of his time."

This gentleman said, "Well, that settles it, you could not decorate my house or do my interior woodwork because I can see that that is your interior woodwork and not his, it does not fit him." I simply tell you that to point out that what we have to do if we are going to have real architecture is to make our product more than beautiful, more than fitting to the situation, primarily fitting the man that is to live in it or the purpose for which it is to be used. That means a pretty savage thing sometimes; it means that if we are going to build a house for a vulgar man, that we must build a vulgar house. It wouldn't be architecture if we did not. It must be better than that man; it must be what that man might be, it must represent that, but unless it has in it some element of that thing which makes him the vulgar man, in my judgment, it is not architecture at all, we are up against difficulties and limitations of that kind, and it does not seem to me to be such a bad thing after all. Fortunately the vulgar man usually goes to a vulgar architect, so that we need not often be seriously troubled that way. (Laughter.) But the fact remains that it must fit the man in some way or other, and I think the most of us (even if we do not analyze these questions of design) naturally tend to draw a vulgar house for a vulgar man. But we must be mighty careful of what we mean when we call a man vulgar. A difference in taste does not constitute vulgarity or the reverse. People have come to me and said, "I like that house out on 40th street, in West Philadelphia, and that is the limit. I have been around your town a little, but there is nothing that I have seen here that approached 40th street: it is absolutely the limit." Most of the arches on the porches are wrong side up, thus:

3

Nearly all of them. My client will say, "I like this or that house at 49th street." And instead of falling dead I go out and try to find what it is he likes about that house; very often it is a bay window on the side of it, or it faces this way or that way, or it has some other feature absolutely irrespective of design or drawing that fits the man. If, for instance, you take a man that likes brilliant colors and set him down as being ignorant and vulgar, because you have put two things before him; one good, in low tones that you care for, and one bad in high colors that you loath and that attracts him because he loves color, you make a great mistake, for that is not a fair test; you ought to put before him things good and bad in both bright and quiet colors, and you will find ninety-nine times out of a hundred he will choose the good thing Find out what it is he likes about the bad thing, give him a chance and he will choose the good thing rather than the bad. If that were not true there would be no civilization; we would have devoluted back into oysters by this time because we have done so many foolish things and so neglected the laws of nature that it must be some principle in us that seeks the right rather than the wrong, to keep us going at all. As Prof. Shortt said to us yesterday, we have gotten away entirely from the mainsprings of the art and architecture of the past, we have come to a time when neither the civic or the religious is the ideal around which we build our civilization, but the individual, the domestic. Take all these high buildings with which you gentlemen are wrestling in pain and trouble (and it is a serious trouble); what are they for? After all are they not merely the places that we go to (to get away from as soon as we can), that we may have enjoyable surroundings in our home life? That is the sole object, and while we should make them as little obnoxious as possible and keep them as quiet as possible, because they tend to ramp and rave —while we should do that it seems to me that our greatest effort should be put upon the making of the object of all this beautiful, and that is, after all, our homes. (Applause). Therefore, I am talking mainly about house design. I want to say, though, that your president yesterday pointed out what seems to me the only logical materials in which to design the office building, and that is a skeleton of steel clothed with a plastic material of some kind. I cannot conceive, though I admit I have done it myself, that it is proper to clothe a steel frame by putting brick or stone around it or any real building material: it is a lie on the face of it, for it would not stick there and stand unsupported. If we must have that kind of building let us encase it with some plastic material like cement. The engineers are looking after the bones and we are after all only the planners and decorators of it.

The most serious question, as I see it, in designing a house that we have to meet with is, what shall the concrete thing be made of and how shall it be made? Or, perhaps, how shall it be made and what shall it be made of? We will treat, what shall it be made of, first. The material must be moderately cheap. We do not often have palaces to build; we are not working for Gould or J. Pierpont Morgan, but for each other, the average community which we find around us; therefore, the buildings which we build must be cheap. They must not or should not require any great amount of ornament; and I want to point out that the bulk of the ornament that we use is used purely to get surface, and not for the value of the ornament itself. The pressed brick of good old Philadelphia was so horrible that after we once waked up and got past the marble steps and marble lintels we flew to the other extreme and brought in the tortured mud (the terra cotta man), with his substitutes for surface; and we put wriggles

all over it to make up this surface; that is what it amounts to, most of the ornament is just that—wriggles; and we smear that over it for no other reason than that we want surface; I do not think that the lack of ornament enters our mind one time in twenty when we put that kind of stuff on; I do not refer especially to terra cotta, but to all senseless ornament. It is because we are afraid the surface will look flat without the ornament, and that is a mighty poor excuse for putting it on. As I say, texture should be the first consideration, because the bulk of our building will depend for its beauty on texture and on the disposal of it's masses and not on ornament. In the first place real ornament that really beautifies the building is too expensive to spread all over it; and, in the second place, you cannot see it if you do so; it becomes merely surface, and here is where fortune favors us, as it so happens that the cheaper and rougher materials naturally have the better textures. I remember when building a house some years ago I arrived on the scaffold just as the bricklayer was starting to build a high kitchen chimney—it was my own house, and I could do as I pleased—and he had there two piles of bricks, very nice bricks; one pile was of quite smooth, beautiful bricks, the other pile was of the roughest bricks that he could get. I said, "What are you going to do with those bricks?" He said, "I am going to use these rough bricks for the lining and the others for the outside." I said, "Reverse it." He nearly fell off the scaffold. I said, "Won't those smooth bricks make a good lining for the flue?" He said, "Yes, very good, excellent lining." I said, "I am quite sure the other bricks will make a much better-looking outside, and that is the part I am interested in, apart from its drawing qualities." So he put the chimney up wrong side out; and when bricks on the inside cost probably $11 a thousand and those on the outside $6.50; and those he had his scaffold down he said to me, "That is the best looking chimney in this town." The rough hard bricks are the only kind, in my judgment, of which to build a country house, the roughest ordinary hard brick that you can get. I will stand fight with a client on that before I will utilize anything else, because it is the brick with texture and color, the brick that has the burnt head on it, not to be picked into a pattern necessarily, but put there to have its influence on the texture and color of the building. What is true of brickwork is true also of stonework, with us. When we really want to get expensive stone then we get Avondale stone, which is as white as the driven snow and as uninteresting as anything in God's creation; or we use rubbed or sawed limestone, and if not satisfied with the surface being perfectly smooth, we specify that it shall be drove-tooled; when it is generally planed on a machine. Whenever they get the chance to put the machine on and make grooves they do it; and all the texture and sense of stone is gone out of it. For house building the rough stone, the common flat stone that we use down there makes, in my judgment, the finest wall surface in color and texture and interesting light and shade that we can get. Next comes another material, and, in spite of what our friends who like dark exteriors say, I am extremely fond of it, and that is rough plaster, the roughest sort of dashed work or pebble dash. I think that when we are considering the color of the exterior we must remember, as your president said, shadow, the shadow of the cave—make it big if you want to; the shadow of the trees that overhang it, the shadows of the vines that grow on it. What is there more charming, more beautiful than the white cottages and thatched or tiled roofs of England, with their beautiful vegetation around them? We may, perhaps, consign white to a greyer climate than ours, but much of the time we could stand white or nearly white here. And this material, it seems to me, is a very valuable one that is much neglected; it gives us mass, it does not chop the surface up, and it gives us a fine contrast with either stone or brick, whether it be white or colored.

Of course we use a great deal of timber work down with us, and I am sorry to say we very seldom use it honestly, most of our timber work being stuck on the outside of the house and not part of the structure. That of course is inexcusable, there is no possible excuse for it, as far as I can see—I do it myself (laughter), but I am ashamed of it and I am trying to stop. It is almost impossible in this country to use it honestly; I doubt if the timbers will stand in our climate long enough when really built in the wall to make it a practical mode of building.

These are, to my mind, the kinds of material that it is worth while to deal with in house-building. Of course we build wooden houses too. We build shingle houses, and they rot out in from a year and a half to ten years; it is not a permanent building material. We have not used tile roofs nearly so much as we might, that is one of the things that I think the architects here and with us should steadily work for, to get some kind of roof that is not flat, stale and unprofitable like slate, or merely momentary like the shingles of to-day. Tiles are just about as hard to get, but as interesting as bricks or anything else in this machine-made age. I will give my secret away—it may be your secret, too—the only tiles I ever put on a building are the seconds, the culls; they are the tiles that are uneven, rough and crooked and of a good color. The average American selected tile is about as good as red slate, but that is all; as far as texture goes it is about the same. It is worth while, it seems to me, to make a fight on some of these materials that we have to use.

Perhaps the most serious problem we are up against is, how to get this material put together so that it may properly be called architecture after it is done. How much of the building that we are doing in this country would we walk out of our way to see in the old country? or would we collect pieces of as we do pieces of the old buildings? That comes back to the proposition of my friend that the architect is not a designer of buildings, but a designer of opportunities and, if we cannot find the people about us who will seize those opportunities and together with us make architecture, the net result will not be architecture; we will have design but not architecture. Here is where I am going to get "reactionary" in trying to go on straight. People say that we are in a condition, and always have been, of evolution, and that we cannot fight against tendencies. But we know how mankind has evoluted in the past, it has been in spirals. When they were rebuilding a brick Rome in marble they little thought that Rome was in its decline. Their literature, they thought better than the more rugged and rough literature of former days; their architecture they thought better, more refined and elegant; but just the same Rome was in a decline and not on an ascent; it seems to me that it is worth while for architects especially to see what can be done in stemming the tide or at least in diverting the tide from methods that are suicidal as far as art goes. You must remember that

though the body of architects is a very small one compared with the community it has been a very efficient mover of the community. The difference between the Philadelphia—I speak of Philadelphia because it is my own place—of thirty years ago and of to-day is almost entirely due to the few architects who have worked for better things there. They insisted and insisted again and again in spite of the conservatism of client and builder that material and design should be better, and they have bettered them. Now it is in our hands very largely to influence the men who do our work by continually insisting on honest work just as our friend who spoke here on decorative work, assuring us of their willingness to co-operate with us. You will find that these men, who work with you in making buildings, will do exactly the same thing. They may be more stubborn about it, and they have a harder row to hoe than the decorators, for the decorators are more closely in touch with their own work than the builders are. They have the work more nearly in their hands than we have. The men who erect our buildings are divided into two classes, the contractors, with whom we come in touch, and the men who actually do the work. The contractor has, in a large measure, ceased to be a builder; he is simply a contractor; he gets a number of sub-bids, adds them together, and puts on his commission for profit and superintendence, and finances the job, and, to a certain extent sees that it is carried out, that the people working under him carry it out. But he has comparatively little touch and little sympathy with the actual workmen who carry out the work, and they are the men that we must go after. It is not the contractors who have much to do with the actual building; it is the craftsmen, if you can call them that, who do the work.

Now, it seems a reactionary proposition, and possibly a hopeless one, to fight against the machine. Here we are at the end of the 19th century, the century that brags more of its methods of production than any other one thing; and I say that those methods of production are themselves absolutely immoral and reactionary. And I mean it. I mean that the method of production that considers only the amount of the product and the profit that can be made upon it, is absolutely immoral, and that the products of these methods are essentially inartistic, especially in our decorative friends' materials. I know, for instance, what it is to try to select papers for other people; I know that always or nearly always, when the people get the paper on the wall they think you have buncoed them; they will come into the room and say, "That is not the paper I selected, it was not that color, it was not that design." There is a difference between the design, which may be very beautiful and the thing you get upon your walls, wherever it is mechanically made. And that is an essential difference. It is a difference that is bound to exist. I do not care how far you may perfect your methods of production if they are mechanical the result cannot be artistic, because art is, after all, as far as I can see it, only the expression of one's own individuality. Hubbard has said that art is the visible evidence of man's joy in his work. And that is almost a definition, but it is not the real definition, because the art is in the doing of the thing and not in the product of the doing. You cannot, if that be true, get art material or art results without artists. The proof that it is true is that the artist never hoards the things that he makes; his real joy is in the making. The rich people do not possess the art of the country, they have the crumbs that fall from the artist's table, and that is all that they can get of it. The artists are the fellows that get the fun out of it. Art truly is to the artist. Now we architects are only half artists, because while we guide the hand we are not the hand. It is a pity, but it is true. And yet we have the biggest opportunity in the world, and that is the making of ourselves and the crowd better men at the same time, and it is in our hands to do it. We may be really leaders, but the evidence of leadership is a following. If we have not a following among the people that create the things that we are supposed to create then we are in nowise leaders; but we have the privilege of being leaders and educators of the people, and especially educators of our co-workers in making architecture. And how shall we go about it? Of course I do not want to be too savage against machinery and I do not want to repeat what I said last night, but I will repeat just one thing that came up in conversation with Mr. Langton and some others.

Mr. Langton—I think it was too good to be lost by not giving it to others.

Mr. Price—This machinery question is a vital one and one we cannot ignore—as to where we can draw the line on the machine. I was trying to make a distinction, and I think I can make one; I think you will agree that the place where we can draw the line is this—just so long as a machine is a tool with which a man works it is a benefit no matter how highly it may be developed, but the moment it ceases to be a tool and becomes a mere automatic machine into which material is fed, and out of which the product comes without any volition of the man who is working it then that machine becomes an immoral affair, and the product of it becomes absolutely worthless as far as the art world is concerned. That seems to me to be the place to draw the line. That does not cut out band saws or turning lathes, or other power tools, but it does cut out much of the work we have to put up with; for instance, it cuts out machine carving in all its forms. It is an easy way to make a yard or a yard and a half or a whole piece of so-called ornament, but of what value is such ornament. Now can we get the people we build for and the people we build with, to go with us, and return if it be a return, towards a more simple method of construction? I think we can. I think that there is one way we can do it if no other, but it would be a drastic method. That would be to cut off all the ornaments, make the thing absolutely simple and plain with only the essential features in it. Then at least there would be no bad ornaments in it. I think we can go a step further, and instead of cluttering up the inside or the outside of our houses with numberless moldings and brackets and "the Lord knows what, of round and square, stuck here, there and everywhere," without any special meaning except that our ancestors or forefathers did it in marble or some other material, for I am afraid that is the reason we put most of those things in—we can eliminate most of these things and substitute for them extreme honest simplicity in construction, and a little bit of good carving, for we still have the carvers left to us and some of the carvers and decorators are really artists and artisans. I would rather have on my wall a patch a foot square of real decoration interesting enough to go and look at twice than to have the room covered with decoration that has no interest except as to design. That seems to me a most practical line of elimination; cut the quantity of it down to the quick if need

be to get the quality a little where we want it. We can do that, and the people will go with us, for they are just as sick of the uninteresting wall papers and truck that their houses are cluttered up with as we are. I have had no difficulty in getting people to allow me to simplify their houses for them. The tendency to ornament comes from the architect rather than from the client, almost every time. Of course there are exceptions and people want a lot of gaudy ornamentation and display; and I think, in these cases, we had better give it to them, I think that is possibly the best way to cure them. It is a little rough on us, but I think we had better suffer if we can make architecture possible in the doing of it.

I have not talked to you about methods of design. I have not talked to you about what moldings you should put here, there or the other place, I think that would be rather inconsistent since I have been advising you to cut them nearly all out. But what I have been trying to do is to point out certain lines along which we shall design; that we shall in the first place surround the client with a shell that shall be appropriate to its site and its use, that we shall simplify it so that we shall get in the main honest construction and honest ornament so far as we use ornament at all. I think you will readily agree with me as to that question of ornament, when you consider, for instance, the main building of your Toronto University and look at the carving on the inside of it (as I did yesterday with great pleasure), where you can walk along from step to step and find the ornament interesting and worth looking at. That was not the architect's fault altogether. When your president asked me to see it he explained to me very carefully that the architect brought out a real craftsman from Germany or some other place and put him to work there, and he put in those interesting spots. The architect can't do that himself.

The President—I told Mr. Price that the architect was entitled to the credit of bringing him out.

Mr. Price—Yes, you did; but the fact remains that it was the craftsman that did the work. The architect gave him, no doubt, an idea of what he wanted, but like all these things that are worth doing or having, they must be designed in the doing, and not in the lay-out of the doing. You cannot design carving on paper; you can only design carving with a gouge and a mallet. You cannot design wrought iron in any place in the world except on the anvil with a hammer. You can make a suggestion for wrought iron or for carving. You can show the general design or character of it, but you cannot draw it until after it is cut or hammered, because otherwise it is not carving or wrought iron at all. We must recollect that our position is the one that I have pointed out, a designer of opportunities; and what we must do to make architecture a possibility is to go to these craftsmen and ask them, if it be turning back, to turn back; and I think we will get something.

Possibly you are not up against the same difficulties that we are, but this is characteristic of what we have to contend with. Take your carpenter, who is your highest class of craftsman because he does the most varied work, and he will plane and scrape and sand paper the sill of a window and will then proceed to get up on it and stand on his heels to pull nails out above. I do not know whether that happens here or not, but it happens with us. And if the carpenter does not do it the decorator will do it for him.

The President—It is usually the plumber who does things in our buildings.

Mr, Price—The plumber generally does not get as good a chance at it as the decorator; and if he does not do it the man that puts up the curtains and window shades will do it. They are bound to have it in some way. Is it not a distressing situation, that our highest class of craftsmen either do not know or do not care about much except Saturday night's part of their work. It is a pitiable commentary on our civilization that the bulk of our people care for the wage and not the work, because the only thing that is worth doing, in my mind, in the world is work. I am quite sure that the same man, when he gets through working at the job he has to do, if he does not work too long and is not so tired as to kill his ambition, turns to other work. I am quite sure that what Prof. Shortt said about himself is true of most of us, that he gets his recreation by turning from the work he is engaged in most of the time and making furniture, carving and doing such work and he thinks his best thoughts when he is doing so. That our craftsmen should have abandoned that position and accepted the 19th century ideal, that the way to get development is to make the greatest number of things with the least possible effort, or in the least possible time so that he may have time to devote to something else, seems to me suicidal. There is something in work besides wages and a good deal better than wages; and I think we can prove it by simplifying the work, by teaching him that he must do this thing in this way because it is the right way to do it and because it is handsomer when done the right way, as well as more moral and that it will be reflected in his character. But when our work is nearly all sham, as it is in one way or another, how can we expect a man working at that sham work to develop into an honest, straight thinker? He can't do it, and the consequence is he walks on our window sill. I do not want to talk longer about this matter; I would very much rather have a good lively scrap in which we all could join, so with your permission I will stop. (Applause).

DISCUSSION.

The President: I think Mr. Price is a little of an extremist in following the rule of leaving his audience when they still want to hear him. But we cannot ask him to speak too much. I should therefore like to hear the discussion which he proposes we should have.

Mr. Baker: I have much pleasure in moving a hearty vote of thanks to Mr. Price for his very agreeable remarks which I am sure we all appreciated; and I think we all, without exception, agree with him. I feel a little at sea in attempting to say anything as I presume I am expected to do, for I see my name on the paper as leader of a discussion on his address; but if I am able to get around in a circle and back to the place I started from I shall be glad. I am a little helped in starting out by being right in my conjecture as to the line of talk that Mr. Price would give us. I did not expect somehow that he would take up design in the abstract and talk to us about how to put the different parts of the whole design together and that sort of thing; I expected more that he would do just as he has done and give us the moral aspect of it. He has told us that we have got to be teachers. Incidentally I think we have to be learners also, because where we get a client who is a cultured man of understanding and learning and refinement we then find that he is quite capable of leading us in some cases; and we should allow ourselves to be led I take it, as long as we are not led away from practical lines. In thinking this over I came across some lines which were peculiary

apt as being spoken by a man of culture and deep thinking and learning, I refer to Swift; he said:

"I have often wished that I had clear for
life £600 a year;
A handsome house to lodge a friend,
A river at the garden's end,
A terraced walk, and half a rood of land,
saved out to plant a wood."

There is a client after all our hearts. The wish for £600 a year was a modest one. He realized that about that sum would be necessary to live in a handsome house, and wants the means to suit the mansion; that is all. A dignified conception, worth considering by people whose means are fixed but whose ideas of the sort of house they would like are expansive. Our poet's handsome house is what? Not a very great house; not an elaborate mansion full of carving and display; he describes it as a house in which to lodge a friend. He does not want his friend to see magnificent ornaments, but to be comfortable and to have pleasure in spending a time with him. Then he thinks of the surroundings of the house, and, as Prof. Shortt told us yesterday, he makes it fit in with nature. He has the terraced walk and ground for the wood, for he thinks of recreation and wants to get it, as in England, by having a cover for partridges and that sort of thing. That is a man we should like to deal with. Mr. Price would have a happy time with him. We should not need to lead him; he could go with us and we should be favored in going with him. When we get a client who has ideas at all that is what we should do. I recently came across some other lines which are peculiarly applicable to the man who wants the display and magnificence that Mr. Price tells us we have got to give him in order to teach him—it is a sort of homeopathic treatment that perhaps in the end will be effective. Pope had evidently been listening to a long oration of the man who had built the mansion in question and, as he was expected to say nothing, he said:

"It is very fine,
But where do you sleep, and where do you dine?
It is clear, from what you are telling,
It is a house but not a dwelling."

What we have got to provide, I think, for our clients is not exactly what they want most but what they need most, and, if they are vulgar people themselves, that will be what will help them to bring their children up, probably without knowing it, in surroundings of refinement and culture. Mr. Price did not touch on the value of travel in this respect, but I think that that is the key-note of the whole thing. He said that during the last ten or fifteen years the architects of Philadelphia have developed on splendid lines and had improved very much, but I think, if we go to the bottom of the matter, we shall find that, while it is the architects that are the cause of the development, it is the fact that architects have had the opportunity of travel and study amongst the best works of the old lands; that they have come back with ideas broadened and filled out, and have seen the reasons for things that are so hard to see in theory. That I think is the secret of the wonderful advancement that has been made in the art of architecture in the United States, as well as in sculpture and the sister arts. I have seen it written somewhere that during the Continental wars, at the end of the 18th century, or the beginning of the 19th century there was a stationary period in the architecture of England; that there was no advancement but rather deterioration. That was attributed to the fact that continental travel was entirely cut off and the younger generations were not able to go abroad and see the good work that was there. And I think that anything that we, as an Association, can do to send our students abroad, as our cousins on the other side of the line have been doing, by offering scholarships for that purpose, will foster in the surest way the rapid development of design. (Applause).

Mr. Wickson: It gives me much pleasure to second that motion. I am afraid that any remarks that I make will be dreadfully prosaic. I simply wanted to ask Mr. Price a very practical question. We have in our neighborhood some very fine bricks manufactured of a dark color, a very beautiful, dark, varying color, which many of our clients wish to put into their buildings. Following the line that you have suggested, that we try to get texture in our brick work and that the bricks should not be too smooth and that sort of thing, we would rather lay bricks in honest mortar; but from my own personal experience I find that these dark bricks which are so much admired, and which are good serviceable bricks as well as good looking bricks; if laid in ordinary mortar do not give a satisfactory effect. It seems almost impossible to get anything like a clear joint—I do not mean a small joint but one which is not ragged—are we justified in coloring the mortar to make it look well?

Mr. Price: I should judge you were justified in doing anything you pleased about coloring the mortar, although it might be possible that you would lose the sense of surface, which you would readily do. I should say that if you must color the mortar, it would be well to do it in such a manner as not to disguise the joints; simply as a question of preserving the texture of the brickwork. Of course much of that effect can be accomplished by slightly raking the joint so that you get a natural shadow on the joint itself, thereby modifying its color.

Mr. Reid (Ontario Society of Artists): I should like to ask Mr. Price if he would color plaster on the outside of a building, since color in the plaster seems to be a way to arrive at an effect.

Mr. Price: I can see no reason at all why we should not color a plastic material of that kind. We color them with us in various ways; some that we call natural and some artificial. The natural way is to color them by using sands of various colors; and that is the best way, because that color is an integal part of the mortar itself and if chipped off or broken can be patched again without disadvantage. Whereas the using of ground colors has this disadvantage that patching is almost impossible. I can see no reason why you should not color mortar just as much as any other surface, any other plastic material on which you wish to get color and texture. I should think however that that color should always be mixed in, not applied, because the tendency of applied color is to destroy the texture.

Mr. Simpson: There was one thing that struck me in Mr. Price's paper. I cannot remember in detail all that interested me, I hope to read the paper and refer to it often in our Proceedings; I should like to have it indelibly impressed on my mind. There is one thing that I should like to draw attention to now. When Mr. Price was speaking of building according to what our owner's requirements are, it occurred to me how architects allow themselves sometimes to be influenced by the owner's whims that are not really requirements and are not in accordance with good taste. I have noticed that architects have sometimes been afraid of their clients and afraid to speak their minds out. We must distinguish between this and the sympathy with their ideas of which Mr. Price speaks. I am sure we all feel very much indebted to Mr. Price and will be greatly benefited by his remarks.

Mr. J. P. Hynes, (Architectural Eighteen Club): I should like to express my appreciation of Mr. Price's paper or lecture; I feel that it is the most complete thing I ever ran across. In speaking of the texture of materials: Philadelphia has been somewhat of an experimental ground I think for that and I would like to hear what Mr. Price would have to say in regard to the way in which, in the Museum of Natural History of Pennsylvania, they have experimented not only with the color of brick but the size of the joints and mortar Many of us have seen it, some have not. I considered it one of the most interesting pieces of brick work I had ever seen. But I doubt if it is an experiment I should try.

Mr. Price: There is no criticism to make of the brick

work there except on one point and that is that, to carry out their original scheme of a long brick, (I never heard why they could not or did not get it) they bound two bricks together with a fine joint between them. That is of course an essential dishonesty, and a great drawback from a building that is, apart from that, very simply constructed and beautiful. That peculiarity does not shew up in the photograph very well; for one reason because it is only a fragment. You have there a pediment with an entrance door, which is practically but a porch to the main building, with a flat dome back of it, and it naturally looks severe; but the texture of the building is prefectly charming. The bricks are a dark and rather heavy brick, and the mortar is a cement gravel mortar, with three-quarters of an inch thickness of joint, and laid up

Corner Dome of Varied Industries Building, Louisiana Purchase Exposition, St. Loius.

slightly back of the face; that is, it is not a raked joint exactly but it is pushed in as well as they could. They have added a large amount of color work to the building through by introduction of mosiacs in brick and terra cotta and marble and stone; anything at all that would give them the color effect. There is no sham about it as far as I know, unless you choose to call the color of the marble a sham. The marble they use is treated with iron, which rusts it and makes permanent stains. It may be questionable whether that is proper or not, but we should be all very glad if our marble in conjunction with brick work were so unfortunate as to have a nail driven in just above it and became rusted naturally. They have only gone one better than that; and it is probably a color that the marble would get with extreme age.

Mr. Mortimer: What is the size of the brick?

Mr. Price: Ordinary brick, about 8½ inches.

Mr. Hynes: I notice that where they used moulded brick it did not seem to have as satisfactory a result as where they had used other brick in a pattern; a kind of a frieze, with a row of headers under, which is all that marks the change from the wall to the frieze. In other places there is a row of projecting headers which are bullnosed and (particularly as the lines of the brick work are not very good with this heavy joint in it) it seems inappropriate to mould the brick; to put a moulding on something in which a virtue is made of roughness. While the variegation of brick work was kept on the surface it was very satisfactory indeed. I thought one lesson might be drawn from that building and that is to leave moulded brick alone. It was, however, only where the moulded brick projected past the surface that it did not seem to be satisfactory. Where they kept it in the surface, as headers, it seemed to be very effectual as decoration. I do not know whether Mr. Price would agree with that or not.

Mr. Price: I should agree with it very largely. Moulded brick of course is very dangerous material, because the essence of the building is that it shall be a long line and the essence of the brick is that it is a short chunk which tends if made too much of to destroy the long line. Much of the best mouldings of that work are not moulding at all but projections which give a shadow and do not pretend to be mouldings. Besides the moulding is smoother than the rest of the brick and gives a difference in texture.

Mr. Helliwell: In common with those who have spoken I would like to express my appreciation of the paper we have just listened to and at the same time

congratulate the Committee, who had charge of the arrangement of our programme, because there has been such a variety of subject and topic. We have had the structural part very well brought before us, and this afternoon we have had this other feature. In connection with the address we have just listened to, I should like to say how fully I fall in with the idea of the importance of house architecture, in this way, that, while comparatively few architects have the privilege of dealing with monumental buildings or even with very large and expensive commercial buildings, there are no architects who have not the opportunity of dealing with the domestic subject. Another point too is this:—when Mr. Price was speaking of the part that the artistic had in the production of architecture, and in connection more particularly with the use of material in its common state, such as brick of the coarse stamp; it struck me that this coarse texture, one of the beauties of that kind of material, depends more on the way in which it is put in than on the material itself. Take for instance these bricks of which we have heard, the mottled or multicolored brick; there are instances in our city, known to us all, where these bricks have been used and where the effect is not altogether pleasant; where we have a rather speckled or spotted effect; there are cases, on the other hand, where the bricklayer, in using this brick, has exercised his judgment and taste in working the brick together in such a way that the effect is beautiful. This is one of the instances in which I think we can see the advantage and great importance, if we are to have the best kind of results, of the craftsman himself entering into the feeling of the architect and the idea which is sought.

Mr. Burke: That very point came home to me very closely when I was building my own house; I had practically to educate the bricklayers. I went down to the brick yard and saw a pile of culled bricks there that the brick manufacturer said came off the arch of the kiln. I said, "Those are the bricks I want." I had a great deal of trouble getting sufficient to do the work because the bricklayers were rather wanting to throw out the roughest bricks; they wanted to get the bricks all the one color. Whereas I did educate them to understand that they should just take the pile as it was; not to deliberately put a black brick against a yellow brick, but exercise a little judgment. They took the run of the kiln. With regard to the chimney Mr. Price spoke of I had the very same experience; I had only just enough brick left to finish my chimney; and the hod carrier said, "We have not any bricks." I said, "Yes, there is a pile there." "Oh, he said those are all knobby bricks; great big knobs on them; they wouldn't do at all." I said, "Take them up." And I think I have one of the prettiest chimneys in Toronto in consequence. Regarding the question of design in connection with the steel framed buildings I think Mr. Price struck the right note there, that the cover of the steel should be a plastic cover. Then comes in the question how to make our plastic covering agreeable to the eye. We all know of course that Portland cement has not an agreeable color and it is practically impossible to make it agreeable. It seems to me then that we should get a plastic material with an agreeable color; and what more agreeable color could you think of then tiles; carefully made tiles or tiles of suitable color? Should not this, then, be the future of the steel framed building covered with plastic material?

The President: We cannot close this discussion up in the absence of Mr. Price who has been called out of the room to speak to some one and we will have to converse among ourselves as he is unfortunately speaking to a friend outside. The principal difficulty about molded brick is always that a molded brick is out of scale and it is difficult to get any scale for a building with molded brick because the horizontal size is too small. I was very interested in a point that has been spoken of by other speakers; in the way Mr. Price proposes that we should look at the point of view of our uncultivated client. He likes something and it is a bad thing, but what he likes is not necessarily it's badness; and what we have got to turn our minds to is to find out what is the good thing in it that he likes and we can appropriate. The client who admired the building on 49th Street evidently was a Philadelphian who had had enough of the old fashioned Philadelphian work — two windows and a door, with marble lintels, downstairs, and three windows, with marble lintels, in upstairs; a pressed brick front; and what pleased him was the life he saw in the inverted arches on 49 Street. It is quite possible to fiet the idea that he wants some life; to avoid the monotony which he wished to avoid, without perpetuating bad art. If a client likes bright color it is possible to give him bright color without giving him crude color. I was glad when I heard Mr. Price was coming to speak to us because it is impossible to see any representation of Philadelphia work or hear anything about Philadelphia without perceiving that there is a great deal of life there; and I thought we should get some life. We have certainly done so. Mr. Price has demonstrated that although the pen is mightier than the sword the tongue is mightier than the pen. I think if we could have him a little more amongst us we should soon be strongly infected by the spirit which is in the air now, and nowhere, I think, more than in Philadelphia. I am glad to see such a meeting as this, it could not have occurred fifteen or even ten years ago. The public are getting interested in art. If we could have a little more of Mr. Price—we shall have a little more of him when we read the Proceedings. We shall do a great deal to bring about what Mr. Hughes said at lunch about having an ideal and bringing our environment into harmony with that ideal. I have much pleasure, Mr. Price, in presenting to you the vote of thanks.

Mr. Price: I should just like to acknowledge the extreme pleasure I have had in being here with you, especially in being able to be with you through the entire session. I doubt whether it is possible to speak intelligently to people that you do not know, any more than to build houses for people that you do not know; but if there has been anything in the few rambling remarks that I have given that have been good for you I feel quite confident that you yourselves have brought it out by your sympathy.

At the Louisiana Purchase Exposition the building of the State of Washington is to be in the form of an octagonal tower 114 feet high. The framing is to be all of wood and the main members will be eight diagonal timbers resting on the foundations and meeting in an apex. Each timber will be over 90 feet long and 24 x 28 inches in cross-section in one piece.

How Greater London grows is shown by the annual report of the Chief Commissioner of the Metropolitan Police, who gives a return showing the number of new houses built and new streets and squares formed, with their length in miles and yards, during the past year. There were 27,174 houses built, 301 new streets formed, occupying a length of 60 miles 408 yards, whilst the number of new houses in course of erection was 6,449. There was just over 2,000 more houses built than in the corresponding period of the previous year. Since 1891 the number of new houses built number no less than 1,812,127, the number of new streets made being 8,643, and seven squares, the length of such being 531 miles 206 yards.

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PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS.

The Association met in Annual Convention in Montreal on January 22nd, the President Mr. Joseph Venne, presiding. Among those in attendance were the following:—Messrs Joseph Venne, W. E. Doran, A. T. Taylor, A. Raza, J. P. Ouellet, L. Lemieux, L. A. Amos, M. Hogle, S. Lesage, Charles Bernier, A. Chausse, Alph. Venne, J. Carmichael, J. S. Archibald, D. A. Brown, Professor S. H. Capper, Raoul Lacroix, A. Sincennes, G. R. Gardiner, H. C. Stone, and L. Z. Gauthier.

The work accomplished by the Association during the year is set forth in the report of the Council as follows:—

REPORT OF COUNCIL.

GENTLEMEN,—The proceedings of your Council for the year just closed may be summarised thus: (a) Lectures and monthly meetings reorganized. (b) Library. (c) Professional Progress and Education. (d) Legal proceedings. (e) Public competitions.

LECTURES—In accordance with instructions given by last year's general meeting, the Council arranged for monthly meetings of the Association, and endeavoured to give to these meetings a social as well as an educational character. The attendance warrants the belief that these gatherings have proved useful to members.

It was not deemed advisable to make a special arrangement for such meetings during the summer months from May to September. As will be seen below, the subjects arranged for these meetings are of an extensive and varied character, the desire being to interest as many members of the Association as possible.

March:—The series was commenced in March with an illustrated lecture on "Electric Wiring" by Prof. R. B. Owens of McGill University, which was numerously attended, the Council having the satisfaction of welcoming a large number of gentlemen interested in the subject outside of the membership of the Association.

April:—A lecture on "Westminster Abbey" by Prof. S. H. Capper, fully illustrated.

October:—At the October meeting a discussion took place on "Professional Esprit De Corps."

November:—The first of a special course of three lectures on "Architectural Jurisprudence," by Mr. S. Archibald, Advocate.

December:—A reception was given to Mr. L.P. Hebert the sculptor, to which members of the Royal Canadian Academy and other artists, both painters and sculptors were invited. The reception was followed by an interesting discussion on "L'Art Nouveau", illustrated by lantern views specially prepared for the occasion.

The remaining lectures on Architectural Jurisprudence will be given in February and March and the special committee, who will continue the organization of these meetings, will doubtless arrange for further subjects of interest for the following months.

MR. W. E. DORAN,
President Province of Quebec Association of Architects.

The Council would point out to the Association that the success of these gatherings wholly depends upon members themselves and the interest they continue to take in them.

Library:—This year the use made of the Library has shown progress. The only additions to the Library have been the usual periodicals; this has been more especially due to the fact that it has been considered necessary to provide an electric lantern and screen, etc., to be used in connection with the lectures.

Professional Education:—In view of the preliminary suggestions submitted to the last annual meeting, and in pursuance of the instructions formulated at that meeting, the Council appointed a Committee, which reported at its regular monthly meeting of June 16th, 1902.

Meetings of the Association were called in July and again in August, to consider this report; but on neither of these occasions was there a quorum of the Association present. The report will, accordingly, be presented at the meeting this year.

Legal Proceedings;—Legal proceedings were taken during the year against one architect who was practising illegally with results favorable to the Association; but, owing to difficulties (more especially of form) in the matter of these legal proceedings, the Council obtained additional legal advice, which should enable the succeeding Council to proceed more expeditiously, by minimizing complications which have hitherto caused delay.

Public Competitions:—The Council, in accordance with the principle already adopted in the past, that public works should be offered to competition, provided such competition be conducted on well recognized and equitable conditions, took advantage of the proposed public library for Montreal to appoint a deputation which waited on the Mayor, in order to urge that this library, in common with other public buildings, be submitted to public competition between architects in good standing of the city, and that a professional adviser be appointed to report upon all competitions. The deputation met with a very favorable reception, and your Council have every reason to hope that this reasonable request will be acted upon.

Examinations:—At the January examination Mr. L. T. Bristow was registered as student, and at the July examination Mr. Rene Charbonneau was registered as student and Mr. J. W. Gregoire as Architect.

ATTENDANCE AT THE MEETINGS OF COUNCIL. 18 meetings.

J. Venne	President	Montreal	14
W. E. Doran	1st Vice-President	"	7
R. P. Lemay	2nd Vice-President	Quebec	..
Prof. S. H. Capper	Secretary	Montreal	14
J. S. Archibald	Treasurer	"	18
G. E. Tanguay	Councillor	Quebec	..
A. Raza	"	Montreal	11
A. C. Hutchison	"	"	4
A. A. Cox	"	"	8
S. Lesage	"	"	9

It is to be noted that Messrs. G. E. Tanguay and R. P. Lemay, being from Quebec, could not attend the meetings.

The Association now numbers 118 members.

Members Deceased;—The Association has to record with regret the death of three of its members during the past year: Mr. V. Roy, past-President of the Association and a distinguished member of our profession in Montreal; Mr. H. R. Falbord of Montreal; and Mr. J. B. Verret of Sherbrooke.

JOS. VENNE, President.
S. H. CAPPER, Secretary.
MONTREAL, January 7th, 1903.

QUEBEC SECTION REPORT.

On the 17th December, 1901, the Quebec Architects elected their officers for the year 1901-1902. Mr. R. P. Lemay was re-elected President of the Section, and Mr. Jos. P. Ouellet, was reelected Secretary and Treasurer.

The Quebec Architects have this year begun to compile by-laws for building construction in the City, which they hope to have adopted by the Municipal Council. They have elected for this purpose a Committee, composed of Mr. R. P. Lemay, President, Messrs. F.-X. Berlinguet, W. D. Baillargc, Thos. Raymond, and Jos. P. Ouellet, to study the by-laws in force in the sister cities of Montreal and Toronto, in order to adapt from the by-laws of these two large cities all that seems practical for local requirements.

The Committee has not yet reported, because the City Council of Montreal and Toronto are themselves amending their own by-laws; and a copy of such revised by-laws will be addressed to the secretary at Quebec as soon as the work is done.

The election of officers resulted as follows:—President, Mr. W. E. Doran, Montreal; First Vice-President, Mr. J. P. Ouellet, Quebec; Second Vice-President, Mr. J. S. Archibald, Montreal; Secretary, Prof. S. H. Capper, Montreal; Treasurer, A. H. Lapierrie, Montreal; Council, Messrs. A. Raza, D. R. Brown, J. Carmichael, J. E. Vanier, Joseph Venne, Montreal, and E. H. Stavhley, Quebec.

At the afternoon session the newly elected President presided. The Educational Committee's report contained the following important suggestions and recommendations:—

"1. That it is timely for the Association to create a scholarship of architecture covering a complete course for the benefit of students bona fide residents in the province of Quebec, and who are employed in the office of a regular member of the Association;

"2. That such scholarship should be for a complete course to be taken for the present at McGill University, as said university is the only one having to this date equipped and organized a complete course of architecture;

"3. That the selection of the beneficiary should be made by competition, the first competition to take place about September 15th, 1903.

"4. That such competition be conducted by a board of examiners composed of three representatives of McGill and three

members of the Association, appointed by Council, with an additional member from McGill as president;

"5. That for the present, and until further change by authority of the Association, the successful competitor for said scholarship must undertake to follow the full four years' course of architecture at McGill.

It is further suggested:—"1. That members be invited to present, either collectively or individually, artistic and professional scholarships under such conditions as they may think proper and as may be acceptable to the university;

"2. That members should select by preference their help from students at the university; further, that some might see their way to make arrangements with students in their offices so that, for the help given by such students outside of the regular season and hours of a college course, the employer might pay the fees of such course. Further, that the university might possibly consider the feasibility of so arranging the hours and even the courses that students might follow the course and attend an office co-ordinately;

"3. That a circular embodying said propositions may be issued to members;

"4. That honorary members be invited to create a travelling scholarship for regular students having graduated and taken their degree in architecture at the university, that such scholarship should be administered by the university authorities in conjunction with the Association, under such rules as may be framed. That such travelling scholarships should be called the "Travelling Scholarship of the Province of Quebec Association of Architects Honorary members,' or such title as may be determined upon."

Professor Capper in referring to the report expressed the opinion that the Association having assumed responsibility under its charter for the qualifications of architects practising within the Province, was also under obligation to do something towards the proper education of the students.

Mr. A. T. Taylor reminded the members that it was largely by suggestion of the Association that the chair of architecture at McGill University was established, yet the Association has so far contributed neither money or students to the support of the movement.

The report was adopted, the Council instructed to take steps to give effect thereto, and power to modify the details with regard to clause 4, referring to the scholarship at McGill.

On motion by Mr. Venne the Council were authorized to take steps to provide a suitable home for the Association.

The following resolutions were also adopted.

By Professor Capper and Mr. A. T. Taylor, F.R.I.B.A.:—"That the Province of Quebec Association of Architects, while desiring to facilitate access for all classes of the community to the park on Mount Royal, protests against any scheme which would destroy the natural beauty or impair the integrity of the mountain as a public park, and detract from its present woodland character."

By Mr. Taylor: "That the Association instruct the Council to press anew upon the attention of the City Council the great desirability of constituting an artistic advisory committee to confer with them on all matters affecting the beauty and amenity of the city."

By Mr. Venne:—"That the Province of Quebec Association of Architects, having at heart the preservation of our ancient mounments, strongly protests, in its character as an artistic profession against the additions that have been made to the Chateau de Ramezay, on the ground that these have seriously impaired the antique character of the building, without any countervailing gain on its artistic or utilitarian side."

It was decided that the next annual meeting of the Association should be held in the city of Quebec.

THE ASSOCIATION DINNER.

The Association have reason for congratulation that their annual dinner, given in the Place Viger Hotel, on the evenng of January 22nd, was such a marked success. It might not perhaps be quite correct to call this function an annual dinner, the last being held in '98, but there are reasons for believing that in the future it will become an annual event. The attendance this year numbered upwards of fifty. Apart from the members of the Association those present as guests were the Hon. Lomer Gouin, provincial minister of public works; Mayor Cochrane; Mr. L. M. Symons, President of the Ontario Association of Architects; Mr. Amos, representing the Canadian Society of Civil Engineers and the representative of the CANADIAN ARCHITECT AND BUILDER. Several members of the Association from Quebec city were present.

One end of the handsome dining room had been set apart and tastefully decorated for the occasion. The tables were arranged in horse shoe shape, the floral decorations being very attractive. The menu was tastefully designed, being printed in white and gold, the front cover bearing the Association seal and the back the names of the officers of the Association.

Between the different courses, orchestral music was rendered and after the cigars were lighted speeches were given by the members and the guests, interspersed with songs and musical selections. Every feature of the occasion had evidently received careful attention at the hands of those in charge, and the function was on the whole exceptionally satisfactory. The President, Mr. W. E. Doran, presided, having on his right, Mayor Cochrane and Mr. Symons, and on his left the Hon. Mr. Gouin and Prof. Capper, of McGill University. Before proceeding with the toast list letters of regret were read from the Lieutenant-Governor, the Hon. Mr. Sutherland, Hon. S. N. Parent, Sir William Macdonald, Mr. R. B. Angus and Senator Drummond. After the health of the King had been enthusiastically toasted, Mr. Doran in an excellent speech, proposed "Our Profession" and in the course of his remarks urged that the proposed Carnegie public library should be placed on such a site as would somewhat inspire the architect instead of being placed in cramped quarters such as have been suggested on St. Lawrence street, where there was little room to make use of elegance of design, such as the character of the building demanded. He claimed that the architectural profession had so far been largely ignored regarding this matter. This had too often been the case in the past; too often the ideas of the architect were unappreciated. Though the world is filled with enduring monuments of the past centuries, the architect's connection with their existence is too little remembered excepting when he has perhaps made a great blunder. There are exceptions to this, of course, as in the case of Michael Angelo's success with the dome of St. Peter's and Christopher Wren's creations in England. The public is always too willing to say of the architect, "Earth lie heavy on him as he has laid many a load on her." The architect, certainly, when he makes a mistake, is pretty sure to hear of it afterwards. Quite different is he in this respect to the physician. As the speaker told a member of the latter profession recently: "When you make mistakes they get below ground but when we make mistakes they remain above." Mr. Doran proceeded to show how broad an architect must be to fill the many requirements which are to-day demanded of him. He must be an artist and have grand conceptions, he must have the practical knowledge to enable him to oversee the workman, he must be a business man and a lawyer, and at the back of these and many other requirements he must be a man of strict integrity. The speaker then outlined the preparation which a man studying for the profession must make and paid particular attention to Canadian conditions and requirements, ending with an announcement regarding the new travelling scholarship spoken of elsewhere in this issue which has just been established. This toast was also responded to by Messrs. A. Raza, Jos. Venne and W. Carmichael.

"Kindred Associations" was proposed by Mr. J. E. Vanier in a pleasant speech in his native tongue. This was responded to by Mr. Symons, President of the Ontario Association of Architects. Mr. Symons stated that he was greatly pleased to be the bearer of greetings from the sister association in Ontario. Architecturally, he said, Montreal is surely a city set on a hill. Speaking of the Quebec Association, he stated, that its charter was a most excellent one. In this respect he considered the Quebec Association was in advance of it's sister associations in the other provinces. The privileges granted the P. Q. A. A. should serve as a precedent for legislation in Ontario. He looked forward to the time when there would be one Association for the whole Dominion. He expressed himself as being pleased to see so many young men present; it augured well for the Association that the young men should take so much interest in the proceedings. He was greatly pleased with the city and contrasted it favorably with Toronto. Montreal had a great advantage in having stone and other material near at hand in which to earnestly, faithfully and truthfully erect enduring monuments which for centuries would be a joy to look upon. In closing, Mr. Symons in behalf of his Association thanked the Quebec Association for the reception accorded him.

A. Chausse, architect and building inspector of the city, was called upon and spoke briefly. Prof. Capper gave a short reading. Mr. Vanier proposed "Our Guests," and this was replied to by Mayor Cochrane and Hon. Mr. Gouin. The Mayor referred to the new library which has been a live issue of late and pointed out the great advantage of erecting it upon the St. Lawrence site which belonged to the city and would take nothing from the $350,000 promised by Mr. Carnegie, leaving that amount entirely at the disposal of the architect. Mr. Gouin made one of the best speeches of the evening.

Songs were given by Mr. Labelle accompanied by Prof. Capper on the piano. The last toast on the programme "The Press," was proposed by Prof. Capper in a humorous and interesting address, and was responded to by Mr. A. B. Pickett on behalf of the CANADIAN ARCHITECT AND BUILDER.

Before rising from the table Mr. Archibald, in a witty speech, proposed the health of that individual whose modern skeleton steel framed structure, covered with rock-faced, grey limestone front, contained a high pressure boiler in the shape of a good warm heart, heated by the fires of interest in the Association— in other words, the President, Mr. W. E. Doran. This toast was most enthusiastically honored.

The function closed with the singing of God Save the King and Auld Lang Syne.

Mr. Wm. Hutchinson, Chief Commissioner for Canada to the Louisiana Purchase Exposition accompanied by Mr. Wm. A. Burns, Secretary of the Exhibition Department of the Department of Agriculture at Ottawa, recently visited St. Louis for the purpose of selecting a site for the Canadian pavilion, and to arrange for space for the Canadian exhibit.

The Prussian Minister of Public Works has issued a recommendation to use bricks of large size in monumental buildings, and in order to ensure that they are made in sufficient quantities and at reasonable prices he places the sizes at 28.5 cm. long, 13.5 cm. broad and 8.5 cm. deep. This is the size of the bricks to be used in government buildings. The joints are to be 1.5 cm. A metre is to be counted as ten bricks.

—THE—

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Contributions of value to the persons in whose interest this journal is published are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

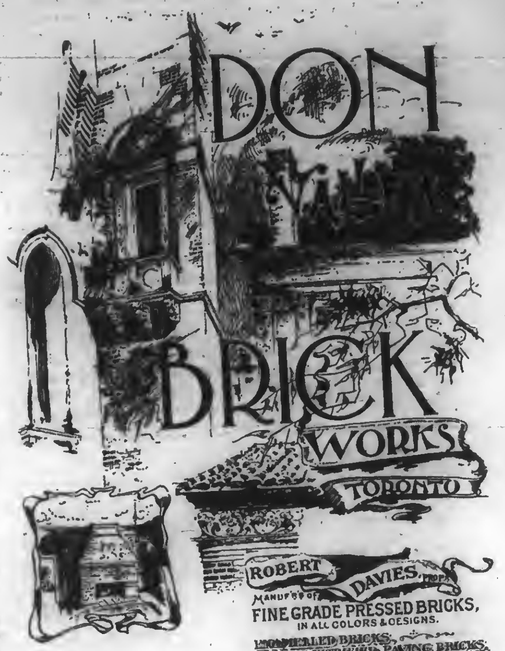
Subscribers who may change their address should give prompt notice of same. In doing so, give both old and new address. Notify the publishers of any irregularity in delivery.

NOTES.

The Bridgeport Wood Finishing Company's calendar for 1903 shows illustrations of the laboratory factories and offices at New Millford, Conn.; mills at Branchville, Ct., and offices in New York, Philadelphia and Chicago.

The next convention of the National Association of Builders will be held in the city of St. Louis during the year of the World's Fair. Preference was expressed that the convention be held in the month of February of that year, although the exact date was left to the discretion of the Executive Committee.

Boston, it is alleged, is indulging in the elevator girl. It is time to call a halt, says the Baltimore Builders' Journal. We are taking too many risks. We do not question the willingness nor the intelligence of the girls who may run elevators, but we should have neither elevator girls or boys. We should have men, and good robust men at that. In case of accident or fire a great deal depends upon the courage and strength of the person in charge of the elevator.



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NORTHWEST LETTER.

WINNIPEG, Feb. 12, 1903.

In giving you a resume of the work in course of construction, in my letter some months ago, I stated that I would give a description of the finished work in this letter.

Of all the large work that was commenced last year such as the Strathcona Block, St. Mary's Academy, St. Stephen's Church, etc., the Canada Life Building is the only one that can be said to be in any way completed. The alterations and additions to this building has entailed a very great amount of unusual work in the way of underpinning. Great credit is due the contractors, Messrs. Illsley & Horn, for the workmanlike manner in which they carried this out. Although they were handicapped in several ways, such as strikes, scarcity of material and labor, they completed the whole work in the space of seven months, which is an extraordinary short period for this western country. The whole of the walls of the ground floor on the street fronts was taken out and rebuilt in Bedford stone, an operation which required the most careful handling and which was finished with the thermometer registering somewhere between 20 and 30 below zero. This work was done alter the remainder of the building was completed, and which therelore necessitated the carrying of the four floors above. The Canada Life will occupy the main portion of the ground floor, the upper portion of the building being laid out as a modern office building.

In looking into the prospects of work for the coming season, it seems almost incredible that the sum of $4,000,000, as given in the daily papers, is to be expended. I have made numerous enquiries as to the authenticity of these figures and find it impossible to arrive at a total in any way approaching this amount. If, as it is reported, this amount of work is to be proceeded with this year it means that there will be a deadlock in all branches of the work before the season ends. A famine in both material and labor will be the result. During the past year, with the small amount of work done, compared with the figures given, there was a paucity in the supply ot all kinds of material and to obtain labor of any description was most difficult. This was most noticeable in the demand for Portland cement and building was stopped in numerous instances on account of the scarcity of this material. Oak is another commodity that cannot be had at the present moment except in very limited dimensions. To remedy the conditions of the supply market immediate steps should be taken by contractors and others to accelerate the shipping of supplies from outside.

In order to be able to successfully cope with larger work, a number of the most prominent contractors of this city have formed themselves into a supply construction company. This company with a membership of twenty-five, more or less, will include members of all trades and the most prominent ones, generally speaking, in each case. The forming ot a company of this description is, I think a very doubtful proposition, and whether Winnipeg will benefit by it is very much a question. It will no doubt be a monoply to a great extent of the building trades and the successful working of such a scheme as this is a matter of conjecture.

In looking forward to the large work, contractors are reserving themselves from tendering on smaller work, and it is now a difficult matter to obtain tenders on such buildings. Work that has been tendered on shows a great increase in the cost of building compared with last year and all branches of the work were then extremely high. It is rather hard as yet, the contractors find, to determine the prices of either material or labor and on account of this enough has to be allowed, and in figuring they must allow on the right side.

Of work that has been mentioned as probable to start this spring the Union Bank, the Bank of British North America and the Canadian Pacific Railway station are among the largest. The Union Bank is to be a ten storey building with steel construction and fire proof throughout, the plans of which are now being prepared by Messrs. Darling, Pearson & Over. The Bank of British North America will be much smaller, being, as I understand, only three to four storeys in height. The plans of this are now being prepared by Mr. Andrew T. Taylor, F.R.I.B.A., Montreal. Several large warehouses are to be erected this year, the plans of which are now in the hands of local architects. Some of these warehouses will cost in the vicinity of $50,000.

A competition has recently been held for the Winnipeg Carnegie Public Library, and although I do not wish to expatiate on this matter I would like to place before you some of the facts relating to the conditions: The cost of the building, including architects' fees and all permanent fittings, was fixed at $75,000. Three premiums were granted: $300 (which was to be included in architect's fee if work was proceeded with), $200, $100. A special committee of the Council of the City of Winnipeg has awarded the premiums. Eight sets of drawings were sent in, all of them being in the opinion of the Council most creditable. The drawings are not yet on exhibition and the only ones I have seen are those of the successful competitor, Mr. H. S. Griffiths, who kindly allowed me to see his design. He regretted that he was not in a position to allow his design to be published until alter he had received tenders, which close on the 24th inst., for if the total cost of the work exceeds the amount specified in the conditions, the work is placed in the hands of the next successful competitor. In plan, Mr. Griffiths has, I think, been very successful and the working of the library should be most satisfactory. In his elevations, however, he has I think been a little too severe and a little more elaboration would have improved the elevations much. He has promised to permit his designs to be published in the March issue of your paper and I will then forward them on to you. It is rather regrettable regarding the criticism and awarding of the designs, that it was conducted under such adverse conditions. It is a well-known fact that the "man on the street" knows practically nothing about the true principles of architecture, and for a body of such men to undertake the criticism and placing of the competitive designs in their order of merit makes the result of the whole work a deplorable fiasco. It seems lamentable that the commissions for such public buildings should be so often granted in this hopeless manner. Of course it may be said that this form of procedure is often adopted and a precedent thereby instituted, but strenuous efforts on the part of architects should be made whereby the criticism of such drawings would be placed in the hands of some competent arbiter. The method employed in this case was as follows—Each plan was submitted with its non-de-plume, which, by the way, an alderman stated was a dissimulation, as he understood the names were known to some of the members of the Council. After several meetings of the Council was held and serious consideration given to the various drawings, they announced that to them the drawings all looked so much alike that they were incapable of determining on any special set. A meeting of the whole city Council was therefore convened to act in conjunction with them and to again discuss the relative merits of each design. The result of this proceeding was that the Council voted on all the drawings and the five most favored were again handed over to be dealt with by the special committee, who accordingly finally determined on the three best.

The mistake made I think, was that when the special Committee found that they were incapable of making a choice between the drawings they did not call in some experienced, capable and thoroughly unbiased authority and thereby obtain an equitable and satisfactory decision.

I notice in the daily press that an offer has been made by Mr. Carnegie to Toronto of a large sum for the erection of a similar building to the above. If this is accepted and a competition held a more satisfactory arrangement than the above, it is to be hoped, will be arrived at.

I intended forwarding to you photograph of the Canada Life Building, but have been unable to get this in time for this issue.

W. PERCY OVEN.

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PUBLICATIONS.

A new work entitled "Letters and Lettering," by Frank Chouteau Brown, has been published by the Bates & Guild Co., Boston, Mass., price, $2. It comprises 200 pages bound in cloth and contains a treatise on lettering, with two hundred examples.

"Common-Sense Handrailings and How to Build them," is the comprehensive title of a new book for the practical man from the ten of Mr. Fred. T. Hodgson, author of numerous well-known practical books for the building trades. The book contains three distinct treatises, each complete in itself and is liberally illustrated with working diagrams explanatory of the text. Price, $1.00. The publishers are Messrs. F. J. Drake & Co., Chicago.

"Wall Paper and Wall Coverings," a practical handbook for Decorators, Paperhangers, Architects, Builders and House-owners," by Arthur Seymour Jennings, editor of the London "Decorator," etc. One large 8vo. vol.; cloth. Price, $2. New York: Wm. T. Comstock.

The book which is liberally illustrated, treats of the seslection of wall papers, varieties and characteristics of papers, tools and methods for hanging, etc.

The Amherstburg Quarry Co. have sent out a calendar showing views of their quarries and shipping facilities.

BUSINESS NOTES.

To meet the demand for a varnish which will give a smooth, hard finish and enhance the beauty of the surface upon which it is applied and for general purposes, the Canada Paint Company have introduced the universal "Sun" Varnish. It is said to have been made from selected clear bright gum and every tank thoroughly matured and tested before being put into tins.

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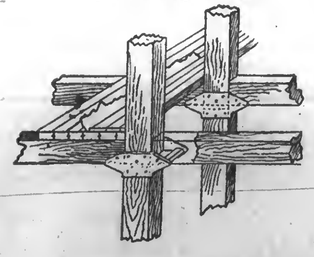

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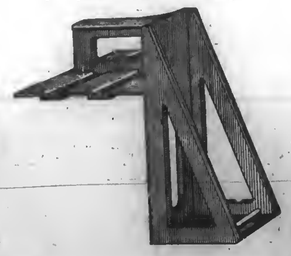

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NORTHWEST LETTER.

WINNIPEG, Feb. 12, 1903.

In giving you a resume of the work in course of construction, in my letter some months ago, I stated that I would give a description of the finished work in this letter.

Of all the large work that was commenced last year such as the Strathcona Block, St. Mary's Academy, St. Stephen's Church, etc., the Canada Life Building is the only one that can be said to be in any way completed. The alterations and additions to this building has entailed a very great amount of unusual work in the way of underpinning. Great credit is due the contractors, Messrs. Illsley & Horn, for the workmanlike manner in which they carried this out. Although they were handicapped in several ways, such as strikes, scarcity of material and labor, they completed the whole work in the space of seven months, which is an extraordinary short period for this western country. The whole of the walls of the ground floor on the street fronts was taken out and rebuilt in Bedford stone, an operation which required the most careful handling and which was finished with the thermometer registering somewhere between 20 and 30 below zero. This work was done after the remainder of the building was completed, and which therefore necessitated the carrying of the four floors above. The Canada Life will occupy the main portion of the ground floor, the upper portion of the building being laid out as a modern office building.

In looking into the prospects of work for the coming season, it seems almost incredible that the sum of $4,000,000, as given in the daily papers, is to be expended. I have made numerous enquiries as to the authenticity of these figures and find it impossible to arrive at a total in any way approaching this amount. If, as it is reported, this amount of work is to be proceeded with this year it means that there will be a deadlock in all branches of the work before the season ends. A famine in both material and labor will be the result. During the past year, with the small amount of work done, compared with the figures given, there was a paucity in the supply of all kinds of material and to obtain labor of any description was most difficult. This was most noticeable in the demand for Portland cement and building was stopped in numerous instances on account of the scarcity of this material. Oak is another commodity that cannot be had at the present moment except in very limited dimensions. To remedy the conditions of the supply market immediate steps should be taken by contractors and others to accelerate the shipping of supplies from outside.

In order to be able to successfully cope with larger work, a number of the most prominent contractors of this city have formed themselves into a supply construction company. This company with a membership of twenty-five, more or less, will include members of all trades and the most prominent ones, generally speaking, in each case. The forming of a company of this description is, I think a very doubtful proposition, and whether Winnipeg will benefit by it is very much a question. It will no doubt be a monopoly to a great extent of the building trades and the successful working of such a scheme as this is a matter of conjecture.

In looking forward to the large work, contractors are reserving themselves from tendering on smaller work, and it is now a difficult matter to obtain tenders on such buildings. Work that has been tendered on shows a great increase in the cost of building compared with last year and all branches of the

PLANS AND SPECIFICATIONS
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$100.00 will be paid by the Moose Jaw General Hospital Corporation to any person supplying the most suitable plans and specifications for the erection of a General Hospital at Moose Jaw, N. W. T., by FIRST OF APRIL next. Cost of building not to exceed $8000.00 Information and particulars furnished on application to

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—IN THE—
ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The Royal Institute of British Architects desiring to give facilities for those in the Colonies to qualify by examination for associateship in the R. I. B. A., will hold the third examination from June 26th, to July 2nd., 1903, in Montreal. Applications, fees and probationary work must reach London not later than April 11th, 1903. Intending candidates who must be over 25 years of age, can obtain application forms and copies of the previous examinations on application to

ANDREW T. TAYLOR,
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43 St. Francois Xavier St., Montreal.

All who are full members of the Province of Quebec Association of Architects and the Ontario Association of Architects by examination, are exempt from probationary work.

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work were then extremely high. It is rather hard as yet, the contractors find, to determine the prices of either material or labor and on account of this enough has to be allowed, and in figuring they must allow on the right side.

Of work that has been mentioned as probable to start this spring the Union Bank, the Bank of British North America and the Canadian Pacific Railway station are among the largest. The Union Bank is to be a ten storey building with steel construction and fire proof throughout, the plans of which are now being prepared by Messrs. Darling, Pearson & Over. The Bank of British North America will be much smaller, being, as I understand, only three to four storeys in height. The plans of this are now being prepared by Mr. Andrew T. Taylor, F.R.I.B.A., Montreal. Several large warehouses are to be erected this year, the plans of which are now in the hands of local architects. Some of these warehouses will cost in the vicinity of $50,000.

A competition has recently been held for the Winnipeg Carnegie Public Library, and although I do not wish to expatiate on this matter I would like to place before you some of the facts relating to the conditions. The cost of the building, including architects' fees and all permanent fittings, was fixed at $75,000. Three premiums were granted: $300 (which was to be included in architect's fee if work was proceeded with), $200, $100. A special committee of the Council of the City of Winnipeg has awarded the premiums. Eight sets of drawings were sent in, all of them being in the opinion of the Council most creditable. The drawings are not yet on exhibition and the only ones I have seen are those of the successful competitor, Mr. H. S. Griffiths, who kindly allowed me to see his design. He regretted that he was not in a position to allow his design to be published until after he had received tenders, which close on the 24th inst., for if the total cost of the work exceeds the amount specified in the conditions, the work is placed in the hands of the next successful competitor. In plan, Mr. Griffiths has, I think, been very successful and the working of the library should be most satisfactory. In his elevations, however, he has I think been a little too severe and a little more elaboration would have improved the elevations much. He has promised to permit his designs to be published in the March issue of your paper and I will then forward them on to you. It is rather regrettable regarding the criticism and awarding of the designs, that it was conducted under such adverse conditions. It is a well-known fact that the "man on the street" knows practically nothing about the true principles of architecture, and for a body of such men to undertake the criticism and placing of the competitive designs in their order of merit makes the result of the whole work a deplorable fiasco. It seems lamentable that the commissions for such public buildings should be so often granted in this hopeless manner. Of course it may be said that this form of procedure is often adopted and a precedent thereby instituted, but strenuous efforts on the part of architects should be made whereby the criticism of such drawings would be placed in the hands of some competent arbiter. The method employed in this case was as follows—Each plan was submitted with its non-de-plume, which, by the way, an alderman stated was a dissimulation, as he understood the names were known to some of the members of the Council. After several meetings of the Council was held and serious consideration given to the various drawings, they announced that to them the drawings all looked so much alike that they were incapable of determining on any special set. A meeting of the whole city Council was therefore convened to act in conjunction with them and to again discuss the relative merits of each design. The result of this proceeding was that the Council voted on all the drawings and the five most favored were again handed over to be dealt with by the special committee, who accordingly finally determined on the three best.

The mistake made I think, was that when the special Committee found that they were incapable of making a choice between the drawings they did not call in some experienced, capable and thoroughly unbiased authority and thereby obtain an equitable and satisfactory decision.

I notice in the daily press that an offer has been made by Mr. Carnegie to Toronto of a large sum for the erection of a similar building to the above. If this is accepted and a competition held a more satisfactory arrangement than the above, it is to be hoped, will be arrived at.

I intended forwarding to you photograph of the Canada Life Building, but have been unable to get this in time for this issue.

W. PERCY OVER.

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PUBLICATIONS.

A new work entitled "Letters and Lettering," by Frank Chouteau Brown, has been published by the Bates & Guild Co., Boston, Mass., price, $2. It comprises 200 pages bound in cloth and contains a treatise on lettering, with two hundred examples.

"Common-Sense Handrailings and How to Build them," is the comprehensive title of a new book for the practical man from the ten of Mr. Fred. T. Hodgson, author of numerous well-known practical books for the building trades. The book contains three distinct treatises, each complete in itself and is liberally illustrated with working diagrams explanatory of the text. Price, $1.00. The publishers are Messrs. F. J. Drake & Co., Chicago.

"Wall Paper and Wall Coverings," a practical handbook for Decorators, Paperhangers, Architects, Builders and House-owners," by Arthur Seymour Jennings, editor of the London "Decorator," etc. One large 8vo. vol.; cloth. Price, $2. New York: Wm. T. Comstock.

The book which is liberally illustrated, treats of the selection of wall papers, varieties and characteristics of papers, tools and methods for hanging, etc.

The Amherstburg Quarry Co. have sent out a calendar showing views of their quarries and shipping facilities.

BUSINESS NOTES.

To meet the demand for a varnish which will give a smooth, hard finish and enhance the beauty of the surface upon which it is applied and for general purposes, the Canada Paint Company have introduced the universal "Sun" Varnish. It is said to have been made from selected clear bright gum and every tank thoroughly matured and tested before being put into tins.

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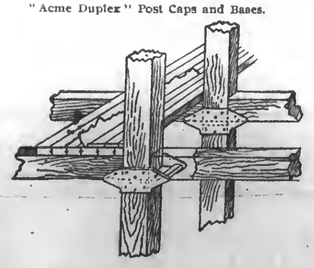

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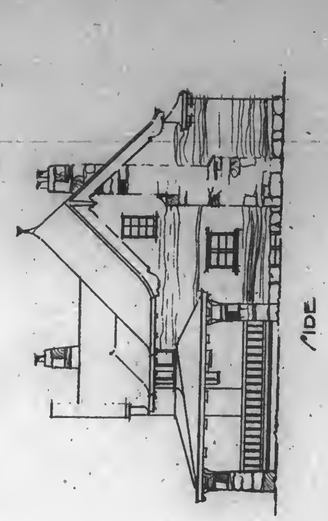

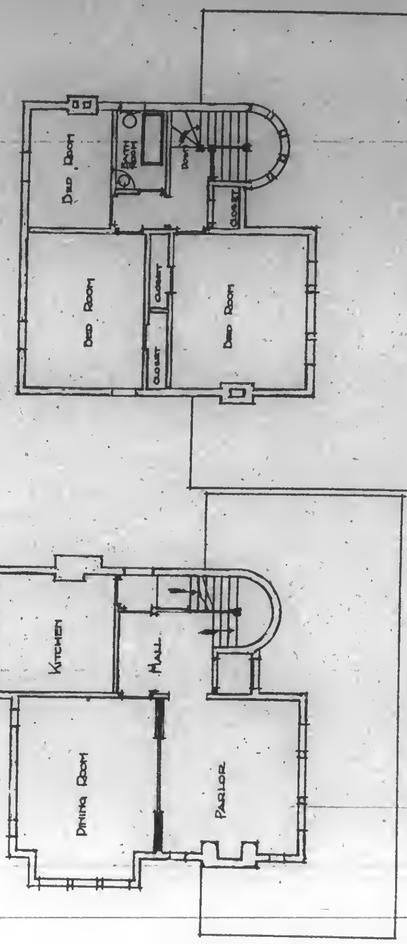

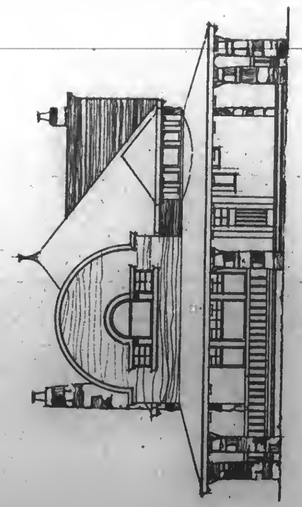

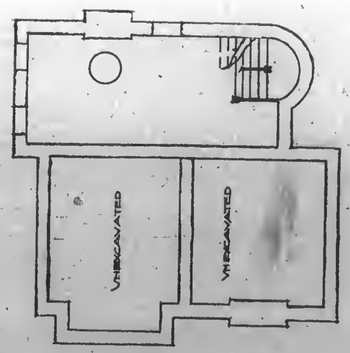

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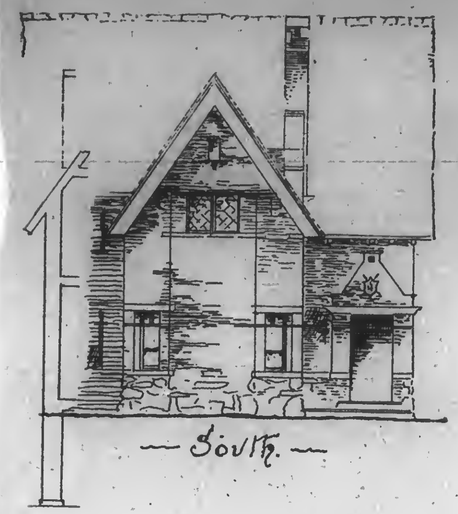
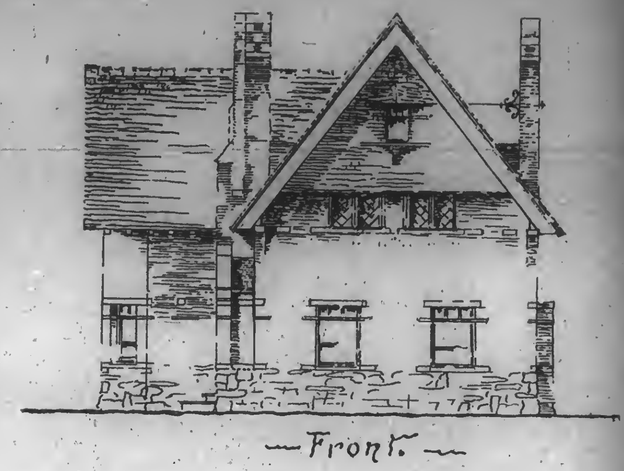
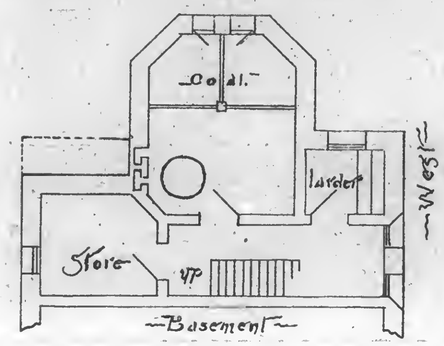
DESIGN BY "CANADA" (MR. A. A. KING), AWARDED FIRST POSITION.

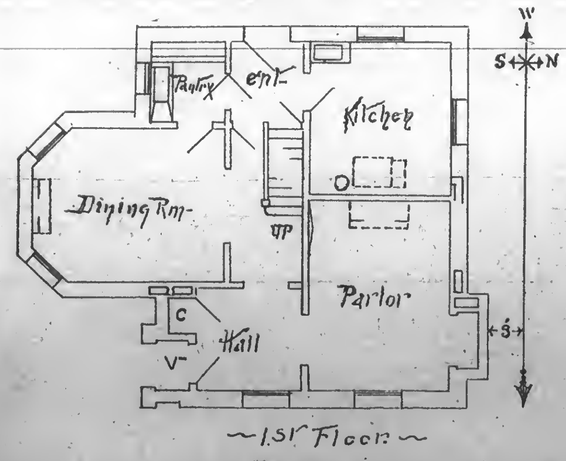
SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
FEBRUARY, 1908

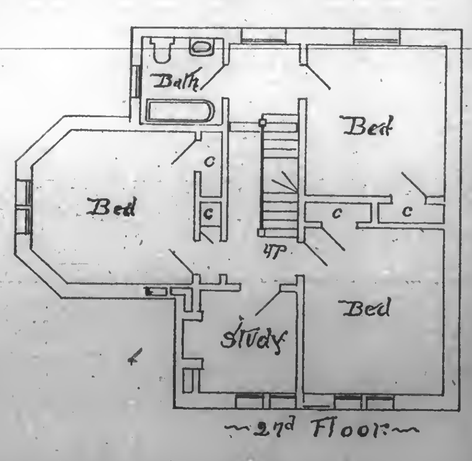
CANADIAN ARCHITECT AND BUILDER.











"C. A. & B." STUDENTS' COMPETITION FOR A TOWN OR SUBURBAN HOUSE TO COST $2,500.
DESIGN BY "PEN" (MR. CHARLES WELLINGTON SMITH), AWARDED SECOND POSITION.

SUPPLEMENT TO
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FEBRUARY, 1908

DRAWING ROOM IN HOUSE IN CRESCENT ROAD, ROSEDALE, TORONTO.
GORDON & HELLIWELL, ARCHITECTS.

SUPPLEMENT TO
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FROM PHOTO AT TORONTO ARCHITECTURAL EIGHTEEN CLUB EXHIBITION

THE BENEDICTINES OF BEURON.

FRIAR BONAVENTURA AND FRIAR PAULUS.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
FEBRUARY, 1903

The Canadian Architect and Builder

VOL. XVI.—NO. 183. MARCH, 1903.

ILLUSTRATIONS ON SHEETS.

C. A. & B. Students' Competition for a Town or Suburban House.—Design awarded Third Prize by "Mayfield," (Geo. C. Egg.)
House, Poplar Plains Road, Toronto.—Gregg & Gregg, Architects.
Polytechnic School, Montreal.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Design for Church in Devonshire.—A. H. Skipworth, Architect.
Church at Abbeydale, Sharrow, Sheffield, Eng.—A. H. Skipworth, Architect.

ILLUSTRATIONS IN TEXT.

Plan of Grounds showing Buildings under construction for the Louisiana Purchase Exposition, St. Louis, Mo.
People's Bank of New Brunswick, Fredericton, N. B.

CONTENTS

Editorial	45-46	Some Suggestions for Young Architects	56
The Effect of High Prices on Building	47	International Fire Prevention Congress	57
By the Way	48	The Decoration of Ceilings	59
The Education of Apprentices	48	Personal	60
Architecture as a Social Art	50-51-52-53-54-55	Notes	ix-x
The Ionic Volute	56		

SPECIAL CONTRIBUTORS.

PROF. S. H. CAPPER, R.C.A., Department of Architecture, McGill University, Montreal
MR. W. A. LANGTON, Architect, Toronto.
" EDMUND BURKE, " "
" S. H. TOWNSEND, " "
" FREDERICK G. TODD, Landscape Architect, Montreal
" W. H. ELLIOTT, Toronto.
" J. C. B. HORWOOD, Architect, Toronto.
" A. F. DUNLOP, R.C.A., Architect, Montreal.
" FRED. T. HODGSON, Architect. Collingwood, Ont.

Government Building Designs by Competition.

It is gratifying to learn that the system recently inaugurated in the United States of procuring designs for government buildings by limited competition among architects of the first rank in private practice, has proved entirely successful. So satisfactory have been its results that it is proposed for the future to include in such competitions public buildings of less importance and cost than those to which the Tarnsey Act was originally intended to apply. With such a precedent before them the Federal and Provincial Governments of Canada should adopt the system in this country. The result would be that Canadian architects would be stimulated to put forth their best efforts, and variety and interest would be imparted to government buildings throughout the country, such as many of the existing ones do not possess. Again, the influence of a number of well designed public buildings scattered throughout the length and breadth of the Dominion would react beneficially upon the general architecture of the country. Why do not the Architectural Associations of Ontario and Quebec earnestly take up this matter and persistently press home upon government the advantages of the competitive system.

Municipal Art Commissions.

The Art Commission of the city of New York is a pronounced success and a lesson to other cities. During the past year they gave an opinion (not always favourable) upon fifty-five sets of plans for different structures; and, as the President of the Commission says in his report, the plans disapproved have been amended or perfected so as to "show a marked improvement, concurred in as such by the original designers." The Commission's principal power is only the power of veto; but that is final, and, as designers do not want to run up against it and be turned back to amend their drawings, the consequence is (to quote the President again) that "greater care is being taken in the preparation of designs than ever has been the case." In other words the old idea is upset—that anything will do for the city; that it is not design that counts but pull. All this is the work of ten gentlemen whose services on this commission cost the city nothing. It surely is worth the while of other cities to get an art commission appointed without delay. Sodom and Gomorrah are not the only cities that ten righteous men could save. No doubt the dread of putting so much power in any one's hands has hitherto been deterrent; but the evidence of New York's experience goes to show that this fear is groundless; that human nature tends to rise to what is expected of it; and that an art commission in whom trust is really reposed will be really trustworthy. The New York Art Commission has the confidence of the community. When the commission declined to allow the old Tweed County Court House to be extended to within a few feet of the City Hall, and so ruin the City Hall Park, public comment was "if we had had the Art Commission earlier we should never have had such a monstrosity as the County

Court House at all." The Commission is a power in the city. Simply by execising it's veto, it kept the committee for the Soldiers' and Sailors' Monument marching about for a site, disapproving of one after another, until the present admirable site on Riverside Drive was found. It has kept numberless unsuitable structures from being erected in the Plaza, to the injury of Central Park. The Commission works. When shall we see something of the sort in Canada? Here is the composition of the Art Commission of New York: The Mayor; three permanent officials, viz.: the Presidents of the Public Library, of the Metrupolitan Museum of Art and of the Brooklyn Institute of Arts and Sciences; three representatives of the three professions of architecture, painting and sculpture; and three gentlemen specified to be not members of any profession of the fine arts. We have at least half a dozen cities in Canada in which a similar body could be selected without difficulty.

The Basing Unit in Concrete.

Mr. Charles M. Crawford, of the Hartford (Conn.) Paving and Construction Co., in a paper, which was read before the Connecticut Society of Civil Engineers, and published in a recent number of the Engineering Record, demonstrates the importance of more accurate definition than is usually given of the basing unit in cement concrete. Mr. Crawford cites the specification for an important public improvement in the State of New York. This specification reads:— the "concrete . . . will be proportioned: — one part by volume of Portland cement; eight parts of volume of aggregate of stone, gravel and sand." The question is, how is the volume of the unit of Portland cement to be measured—in the barrel or out of the barrel? A barrel of cement is the usual unit of volume; but a barrel of cement has two volumes — one in the barrel and one out of the barrel.

Mr. Crawford quotes test measurements of barrels, in which Portland cement of different brands had been packed, as ranging from 3.24 to 3.59 cubic feet; but the volume of the cement, when loose, is greater. Tests made for himself established the weight of a cubic foot of Atlas Portland cement, loose, at 91.27 lbs., making a barrel (380 lbs) equal 4.16 cubic feet. Here is a difference which has a serious bearing upon the question of cost.

Take the smaller measurement. If the "one part by volume of Portland cement" be taken as 3.25 cubic feet, the aggregate will be eight times as much, or 26 cubic feet. Of this 40 per cent., or 10.4 cubic feet (which is about the proportion of the voids), will be sand and 60 per cent., or 15.6 cubic feet will be stone; and the mixture will make about 16 cubic feet of concrete.

If the larger measurement, 4.16 cubic feet, be taken for the barrel of Portland cement;— there will be 33.28 cubic feet of aggregate, composed of 13.31 cubic feet of sand and 19.97 cubic feet of stone; and the mixture will make about 21 cubic feet of concrete

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The cost of these two operations—with cement $1.50 a barrel, sand 60 cents a cubic yard, and stone $1.50 a cubic yard—will, in the first instance, be $4.37 a cubic yard, without labour, and, in the second, $3.74; a difference of 63 cents a cubic yard. We have made the calculation from prices said to have been in force when the work for the specification in question was let. As cement has since gone up in price, the difference now would be even greater. But taking 63 cents as a possible difference in the cost per cubic yard:—as the work covered by the specification in question amounted to about 90,000 cubic yards of concrete, the sum involved in a difference of opinion as to the volume of the basing unit would be, as Mr. Crawford says, "worth considering."

P. Q. A. A. Scholarship.

It is rather remarkable that the well endowed and equipped department of architecture at McGill University should still lack students in spite of the fact that examination is the only way to the practice of architecture in that province. The Province of Quebec Association of Architects have considered it incumbent on them in order to make the benefit of the architectural course felt, to create a scholarship both entitling and compelling the winner of it to take the full four years' course at McGill University. This is no doubt a move that will in time effect its object. The first student who wins the scholarship and takes the course will of course be snapped up by a good office, and then it will begin to become apparent to the rest that something has happened which makes the architectural course desirable. If immediate advancement comes to two or three students who have taken the course, it will become a necessity. A distant view of himself either the better or the worse for having or not having a good professional education it is not easy to bring before the mind of a young man, but he can see immediate consequences; and it ought not take long to fill the architectural lecture rooms of McGill with students, if it is once demonstrated that to have passed the course gives the student an immediate success that can be measured in terms of dollars and cents as well as of opportunity.

A further proposition was made, as an additional suggestion, in the same report of the Educational Committee of the P. Q. A. A.:—that "some (members) might see their way to make arrangements with students in their offices so that for the help given by such students outside of the regular season and hours of a college course, the employer might pay the fees of such course." This in common with the rest of the report was adopted and "the Council-instructed to take steps to give effect thereto," but this is a proposition that requires careful handling lest it do more harm than good.

The thing to be borne in mind, in offering inducements to architectural students to do their studying thoroughly, is that the inducements must be inducements to work, to take the profession seriously; not inducements to enter the profession as the softest thing going; and it is a question—if education is provided, for the mere consideration of filling out the year in an architect's office (which the student would do anyway if he were obliged), for want of this kind offer, to get his training entirely in an architect's office)—it is a question whether the profession of architecture in the Province of Quebec will not have

the greatest claims to popularity with an undesirable class; that class of young men who, with a sort of general capacity in some degree but with no decided bent, are ready to be attracted by incidental attractions in any of the professions. If electrical engineering continues to require a long apprenticeship under the orders of mechanics, while architecture offers a university education free of charge, the usefulness of electrical engineering as a limbo for the vaguely aspiring sons of vaguely aspiring parents, who would otherwise aim at architecture, will be gone; architecture will excel in popularity but its chances as an art will be proportionately diminished.

The same doubt hangs over the proposition to create a travelling scholarship. As stated in the Educational Committee's report the proposition is that only "regular students" who have graduated and taken their degree in architecture at the university "shall be eligible for the scholarship." That is an excellent proposition; but the motion to adopt gives the Council "power to modify the details with regard to clause 4," which is the clause relating to this scholarship.

It is to be hoped the Council will not attach this scholarship to anything less than a full career in arts and architecture at McGill. Then we shall feel sure not only that it is in the right hands but that the process of getting it is too long—requires too much decision of mind towards this career and too much hard work—to attract triflers. It is attraction that is principally to be feared. The actual winner of a scholarship may be of the right stuff but, unless the scholarship is so hedged by conditions of preliminary service that it colours the prospect with visions of work rather than with visions of foreign travel—for every trained and travelled student the profession gains, we shall have another or possibly more whom the chance of free foreign travel has enticed to desert a career of usefulness to others and profit to himself in "business."

THE EFFECT OF HIGH PRICES ON BUILDING.

Attention is being called to the manner in which the demands of workmen in the building trades coupled with the high prices of materials, is checking building enterprise in Toronto.

Notwithstanding the all-round advance in wages last year, several of the unions have already decided to demand a further substantial increase. The plasterers for example, are asking 45 cents per hour, an advance of 7 cents. It is understood to be the intention of the plumbers to demand 65 cents per hour; the painters have also demanded an advance while at the same time they have voted down the request of the employers to be allowed three instead of two apprentices to each shop, and that the term of apprenticeship be extended.

In view of these demands and the uncertainty as to what the scale of wages will be, contractors feel obliged to protect themselves against loss by a substantial increase in their tenders. This has already resulted in blocking considerable work which, had prices remained about the same as last year, would have gone forward to completion.

The opinion prevails that the point has been reached at which any addition to the cost of either materials or labor will prove to be the last straw which will break the back of many building enterprises. This is a particularly unfortunate condition when money is plentiful, and under favorable circumstances would be largely invested in new buildings.

Investors in buildings must keep in mind the possibility of a return of less prosperous times, when if their buildings have cost too much the shrinkage in values may entail upon them a loss. Thousands of owners found themselves in this position on the collapse of the real estate boom in Toronto several years ago.

Some large commercial undertakings may go on in spite of higher prices, but many smaller ones, especially residences, will be stopped. This means a few large contracts for a few large contractors and employment for a few hundred workmen, leaving idle a much larger number of both masters and mechanics.

Workmen give as a reason why they should have more pay that the cost of living, including rents, has greatly advanced. They apparently do not see that this advance is largely due to their constant and ever increasing demands for more wages and shorter hours, and that as they comprise the bulk of the consuming class, they are themselves called on to bear the heaviest part of the burden. This was clearly demonstrated by the recent coal strike, the effects of which were felt most severely by mechanics and laborers. This strike has probably permanently increased the price of coal in this country. In the case of articles of general consumption such as fuel, the use of which cannot be dispensed with, the future policy of the producing companies will probably be to cease fighting against higher prices in behalf of the consumers from whom they get no thanks, and to accede to all demands of their workmen and charge up the extra cost to the consumer. Who is the consumer? In seven cases out of ten he is the wage earner, the man who is least able to bear the added burden.

In the case of the building industry, the conditions are somewhat different, but the result is much the same. People are not obliged to build expensive residences—they can live in the old ones, take rooms in an apartment house or an hotel, or adopt other modes of living which are at least less expensive and freer from care than the management of a modern house. So it happens that when prices of materials and labor reach a certain point, building enterprise slackens, the demand for materials falls off and the mechanic in the building trades and in the factory is thrown out of employment. All of which goes to show that it is possible to kill the goose that lays the golden egg, and also that to do so is a very short-sighted and unwise proceeding.

In joining parts of metal and glass by means of plaster of Paris, a serious source of trouble (according to "Werkstatt") is the tendency of the plaster to set and harden before a proper cementation has been attained. This can be easily prevented by adding to the water with which the plaster is mixed 6 per cent. of alcohol. Then sufficient time will be allowed for cementing before complete hardening occurs. Too much alcohol must not be used, otherwise the plaster will not harden.

COLOGNE CATHEDRAL.

BY THE WAY.

In the opinion of the Irish Builder Chubb's new patent front-door latch, with very small key, is an extremely handy, up-to-date idea. The Club man who may have occasion to use the very small key has yet to be heard from.

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Towns like individuals frequently refuse or neglect to profit by experience. A case in point is the town of Liverpool, Nova Scotia, which, although fire swept only seven years ago, has again been almost wiped out of existence by fire.

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A prominent bank president of Hartford was having his house repainted recently. To him entered a caller, who said:—"Do you know that your house is being painted by non-union men?" "Yes," was the answer, "I took particular pains to find them. Get out!" That is all the story, except that the house is painted.

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Colonel Butler, a former Sessions Judge in Burma, and retired, happened to be an artist and has painted some very pretty scenery as well as birds and flowers in the Japanese style on the walls of the Maubin Court House in Lower Burma. It forms says Indian Engineering, a pleasing contrast to the generality of such buildings, though we fear the minds of accused persons committed to the Sessions are too much occupied with other thoughts to appreciate pictures, however artistically they may be depicted.

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A British contemporary tells a good story of an old lady passing by the scene of the demolition of the famous old Newgate Prison in London the other day, when she espied the contractor's enormous steam crane. Appealing to a wily crossing sweeper, said she, "Can you tell me my good man what is that for?" "That 'laidy,' says the wily one, "that is the famous gallows you must have often heard of. Aye, 'laidy,' many's the sickening sight I've often witnessed on that 'ere 'gallis'—take away yer appetite for breakfast—'twould," and as he wiped his eye and pocketed the two-pence; reflected that it was well earned.

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A curious action at law is said to be pending in connection with what is known as "The flat Iron Building" on Broadway, New York. The owner of a store opposite this building is said to have brought legal action to compel the owners to reimburse him for the breaking of his plate glass windows by currents of wind alleged to have been deflected from the slanting walls of the "flat iron." The plaintiff alleges that pedestrians have been thrown to the sidewalk by the wind while passing this building, and that in consequence they now avoid the locality. He proposes to secure the testimony of such persons as well as of architects and other experts in support of his claim.

THE EDUCATION OF APPRENTICES.

A series of lectures to masons' apprentices were given last winter by members of the Illinois chapter of architects, and were so successful that it has been decided to continue them during the present winter. The master masons and the masons' union have arranged an apprentice system under which each apprentice receives three months' schooling each year, during which time he is obliged to attend school and also receives his pay from his employer.

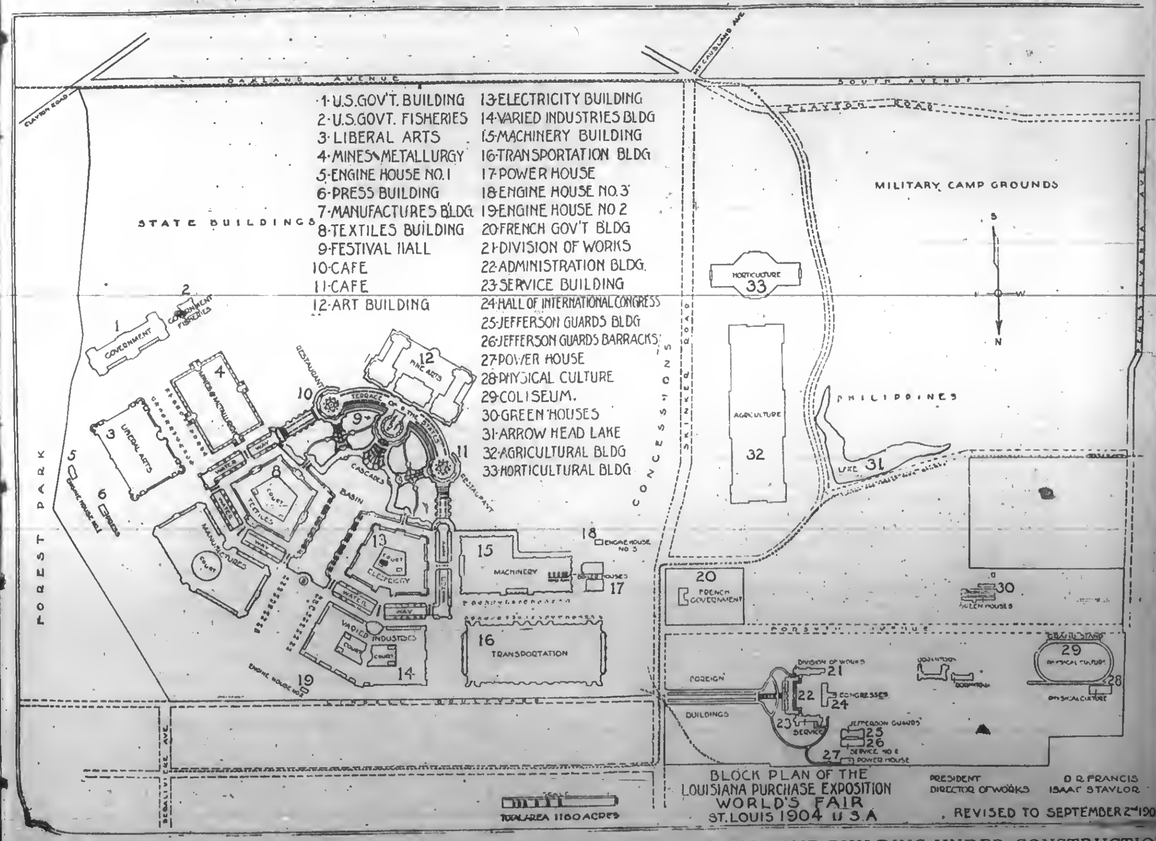
The Inland Architect states that the city of Chicago has also arranged school-rooms and teachers for their special use, and their studies not only comprise elementary branches, but follow such technical lines as will best serve them in their work. It is encouraging to note that of the apprentices who attended school last

PEOPLE'S BANK OF NEW BRUNSWICK, FREDERICTON, N. B.

winter not one seemed indifferent, and many attended the night as well as the day classes, and all were enthusiastic and diligent. This has all been accomplished by the unselfish work of a few men who wish to aid in the elevation of the workman and the improvement of his work, and shows what can be accomplished in every trade, and how gladly such aid is accepted by the young mechanic who wishes to succeed in mastering his trade.

The Engineering Record states that the lettering of titles and important legends on drawings is expedited in the drafting rooms of the Bureau of Filtration, Philadelphia, by the use of standard letter sheets about 11x14 inches in size upon which are printed five standard alphabets and sets of numerals in plain Gothic type. These sheets also contain words most frequently occuring in titles and other places printed in the size of letter most frequently used for them. In this way a great deal of time usually spent in spacing is saved, for the draughtsman can slip one of the standard letter sheets under his tracing and copy the words needed.

LOOKING EAST FROM MACHINERY BUILDING—VARIED INDUSTRIES ON THE LEFT, ELECTRICITY BUILDING ON THE RIGHT.



PLAN OF GROUNDS FOR LOUISIANA PURCHASE EXPOSITION, ST. LOUIS, MO, AND BUILDING UNDER CONSTRUCTION

ARCHITECTURE AS A SOCIAL ART.*

Prof. Shortt: Mr. Chairman and Gentlemen: I come before an architectural organization with a great deal of diffidence, because I cannot say that I am even an amateur in architecture, but simply a much interested reader on architectural subjects, and much given to the observation of buildings and other products of architecture, and of the allied arts. I had written out my paper, but from the nature of the questions with which I wished to deal, and which were mainly suggestive, I thought it was rather too stiff, and looked altogether too important for the matters I had to bring up; I wish, therefore, the members present to understand that what I am throwing out is simply a series of suggestions with reference to some problems which have presented themselves to my mind. In considering the subject of architecture as a social art, the question arose, Whence came this art? What forces have determined its growth and what is its significance for the public at the present time? You will see, therefore, that the line which I am to take is not one which concerns itself with the technical aspect of architecture, but rather with its relation to the people. Each art has its special votaries who understand its details, its principles, and so on; but these arts, and architecture above all others, have a special significance for the public. Therefore, the question arises, how did the public come to be interested in architecture, and what is its significance for them?

Now, in this respect it seems to me that architecture, in common with several other arts, is not on the basis of most of the sciences, and particularly not on the basis of a science such as mathematics. The determination of the artistic or proper features of architecture are not to be worked out as we work out the fact that the three interior angles of a triangle are equal to two right angles. When we have discovered that proposition we have discovered something that was eternally true and will be true for all times. When we have discovered a principle in art, it does not necessarily rest upon the same basis, for it may be modified very greatly as time goes on; and the problem, therefore, which I have set before myself, and on which I wish to make some suggestions is, Whence arose this feature of architecture, and what is its significance? It seems to me that here we are face to face with a problem that is incident to the beginning of human interests. What were those beginnings? They were connected with the fact that man had to make his own way on this earth, that is, they are connected with the struggle for existence.

I say the foundations of architecture are associated with the foundations of man's living on the earth. Self-preservation, therefore, is the fundamental feature. At first sight it may seem strange that self-preservation should have any connection with architecture, yet the connection is quite real and vital. When we come to consider what it is that has built up mankind, his interests, his senses, and his feelings, what we discover is, that the stimulus has followed two lines:—the seeking of that which is favorable to the race, and the avoiding of that which is unfavorable or destructive. There is a common myth abroad that the beginnings of human interests were individual, that the struggle for existence is the struggle of the individual to maintain itself. That is not a fact, as can be found by investigations all the way back through man and the animals too. The instincts that are registered in humanity and the animal are instincts for the preservation of the race. Another false conception is that the pleasurable feelings are associated with preservation and the painful feelings with destruction, Now, as a rule, pleasurable feelings are associated with preservation and the maintenance of existence, and many of the painful feelings with destruction, but not all. And I think that none of our secondary interests would be maintained, or would indeed have existed had only the pleasurable feelings been developed. Thus, we find that, going no further back than the savage, when we ask what it is that is registered in primitive man, what is his interest in this, that and the other thing, we find it due to that minute and careful study of nature forced upon him by the avoidance of his enemies and the pursuit of his prey. Thus, the accurate knowledge which the savage acquires from his close study of the bent twig or the crushed leaf, of the trail of the various animals and of all nature's conditions, is the outcome of ages of specialization in which he has had to attain to accurate experience of these before he ever waked to a secondary interest in them. Thus the eye was not formed to see beautiful colors, or fine forms, or anything of that kind; the eye was formed as a concentration of a certain nervous structure in the body for self-preservation; and so with the other organs which in lower animals are simply diffused feeling, but in the higher animals, and in man particularly, are aggregated into special senses with special functions for preservation; but there comes in connection with them the secondary satisfaction in succeeding, and the horror of failure which is associated again with the preservation of the race. Again we notice in the domestic animals as well as in wild animals, that when an animal has not its full capacity drawn upon in the pursuit of prey, in the avoidance of enemies, or in its other functions of life, it simulates the familiar process, and the animal plays at that which is its life-work. And you will notice that the wild animal and the domestic animal not only take pleasure in stimulating joyful feeling, but they alarm and strike terror into each other, taking interest in developing that side as well as the other: thus the comedy and the tragedy of life are remotely born in man and are there before they ever come to a conscious condition at all. But eventually man relates these things to a purpose. He acquires an interest in life that is not merely that of incidentally obeying instincts, but that undertakes to take hold of these and make something of a purpose in life, within the spiritual continuity and unity which is expressed in humanity; that spiritual unity is the one great feature of humanity, not the elements that it unites. The elements that it unites are animal elements, the senses and physical needs. But it is the spiritual unity that gives them meaning, that first of all takes these elementary purposes and moulds them into some connected view of life. Now the first phases of that connected view of life, as we see, are associated with the interest in the secondary features of animal life. It is there that the significance of the arts for human life comes in. How is it that man should come to unify any of the feelings connected with the senses along an artistic line? What is the force behind the expression? Well, it is usually a force connected with awe and fear, rather than with immediate pleasure. An art whose products are associated with the awesome, the fear-inspiring, emphasizes the threatening aspect of existence which most arrests human attention. That which falls in with our everyday needs, and satisfies these needs, passes unobserved; and thus it is we take more interest in the failures of life than the successes, in a way; therefore, primitive man in his aspiration is more actuated by fear than by pleasure. All primitive religions, also modern savage religions, are connected with the worship of evil spirits much more prominently than with the worship of good spirits. And why? Because man wants to propitiate the evil spirits and escape them; and consequently his first worship is entirely sacrificial. Anything that will appease these spirits is the proper thing, and that is characteristic of all savage and barbaric people in the spiritual line. This feeling is hidden deep in human nature and expresses itself in the child,—you all have had experience, no doubt, of some sort of terrible creature, suggestive of a bear, a tiger, a dragon, or other fearsome thing that is apt to inhabit the dark recesses of an ordinary domestic home, being apt to go upstairs behind you or come out of a closet and attack you. That is simply the unconscious expression of what has been rooted and grounded in the savage nature of man for ages; and the time between savagery and civilization is so short that it can't be got rid of; thus the child reproduces many of the things that its savage ancestor most feared. What is the significance of that for architecture and art in general? It is, that in order to give concrete expression to his feelings, in order to afford these vague beings a definite worship, man undertakes to give form to associations, to construct fetishes and other grotesque objects of worship, which, at first, are of the most vague and uncertain character, but are afterwards given an architectural clothing or housing. Thus, we can find to-day all the phases of this from what goes on in the central tepee, the public and religious tent or structure of the savage, right up to our Government Buildings and cathedral churches. We can find it not only historically up through the ages, but contemporaneously through different peoples at different stages. All these features then, associate themselves with this art, the first effort of the savage to embellish the tent which houses his religion and his politics. The common council house, which is at once the centre of the medicine man's activity and the councillor's oratory, is specially built and ornamented and rendered symbolic. Domestic architecture is a mere reflex from that, but has no great interest in it. This same feature which is the basis of architecture is associated at an early time, in the case of our own institutions and those of the Greeks and Romans, with ancestor worship, and the perpetuation of the idea of immortality. Consequently, the first temples are also, as it were, the first tombs; and the tomb-temples of Egypt, rock-hewn structures, are the beginnings of much of the higher architecture of the country. There is a link here that has been lost to us, because the first structures were usually made of the material at hand, perishable material: wood, clay, brick, and so on, colored and decorated with totems and things of that sort, which express in these grotesque forms the aspirations of the people. Those are swept away or eaten up by the tooth of time. Only when we come to rock-hewn temples or structures carved or built up out of stone do we get anything that persists through the ages. And, as you architects all know, when you come to examine these structures you find they are reproductions, even the finest Greek temples, of wooden-built structures; structures erected of beams, timber and posts; that is their essential character, but they are in many cases very elaborately modelled and ornamented, raising the simple elements to a higher degree, as it were, by an elaboration of them in a large temple. When you take, therefore, the construction of the Egyptian temple, you find the oldest of them and the most remarkable express above all things mystery and fear rather than beauty. Yet there is a beauty in them, too. There is the obvious aspiration of the human spirit; the feelings of the men who raised these temples are wrought into them, and their interest in nature is also expressed, for though the work be crude in technique, it is exceedingly accurate and living in the spirit of it. That is, they show themselves, before they have got the technique, to be able to appreciate the fine things in nature. Even primitive creations that are dug up, the scratchings of animal forms on bones, shells, and so on, while rude and crude most of them, are essentially accurate with reference to nature, and show that their authors were still very close to nature. I omit, in order to get on, the Assyrian and Babylonic fragments, and come to the Greek temples, which in so many ways resemble the Egyptian, and what do we find there? We find a higher expression; we find less of the fearsome or awesome, less of crude mystery and more of intellectual beauty. Why is that? Because the Greeks in their rapid development had come to understand nature at large more fully than the Egyptians, had come to understand that there was less of the blindly threatening aspect in it, and more that could be understood and appreciated. With a rising sense of beauty the Greek spiritualized his architecture; he turns the Egyptian temple inside out, and instead of clustering all the columns inside to make it dark and mysterious and threatening, he puts them outside and ornaments them, while he expresses in the interior simplicity itself. Altogether the structures expressed a civic and a religious feeling which showed the real core of the civilization of the Greek. Concurrently with these beautiful structures come the other arts which are all the children of architecture. Painting, sculpture and all these things came as accessories of architecture, not as things developed on their own basis and put into architecture. But as civilization advances, becoming more complex, these things come to be separated from architecture, and have an existence of their own. Thus, at a later stage, pictures are not painted merely for mural decoration, but for interest in the subjects separately,—they can be carried about and hung up here and there to be seen; and so with statuary and music, and a good many other things which were all associated with religious and social art. I use these terms religious and social as interchangeable. When we go back to early society we find there is no difference between the religious and the social aspects of it; their politics were religious, and their religions were political. The embellishments of the temples and meeting-places were all connected with this one social structure, because individualism was something that was to be developed at a later stage.

Thus, we find that all the great original architecture is social;—there is little or nothing that is

*Paper read at the annual convention of the Ontario Association of Architects held in Toronto January 13th and 14th, 1903.

original or important in domestic architecture; it is simply the reflex of the ideas that were carried out in a larger scale and in an original degree in the social and religious architecture.

When, however, we come to the Roman we begin to note the separation, the development of a style of architecture that was more domestic and an application to it of original features, as is shown in the Pompeian remains, and that was partly due to the fact that the old Roman religion had gone to decay. The features of individualism creep in and change the character of architecture. The Roman architecture is the first, it seems to me, which shows a wantoness, which no longer expresses the purity of an aspiration. The buildings often lack high character and chastening purpose. Thus, there is the application of ornament merely as ornament. Now, that never was shown before; it was ornament subordinated to the great purpose of the temple or the structure.

The next great movement that I want to touch on in this connection, is the development of architecture through the Christian church. We come back, through the Christian church when it had dropped its individualism, and got to be a unified church, to a great organization with aspirations of a high order. Under the church the Roman Empire again took the lead of civilization, both socially and religiously. There we get a structure that calls forth once more all that is great in man; and once more it finds visible expression in architecture. The domestic habitations at the time of the building of the great cathedrals were poor things, attracting little attention; and the castles and keeps were for strength, and if strength were got, ornament or any higher aspect of architecture was largely neglected. There was indeed a secondary influence coming in afterwards from the religious side, which rendered these feudal keeps and castles more artistic and architectural. But the great cathedrals of Europe once more expressed in themselves thorough appropriateness and great human interest. There you see once more that no sacrifice, no artistic ability, no power that can be suggested, is too great for the realization of this idea; and therefore, they built as well and as nobly as ever they possibly could; but in doing so they were doing just what the primitive savage had done in setting up his council house, in ornamenting it and associating his life with it. But from the time of the great religious structures we come to a condition of things which, as soon as we strike the decay of the religious feeling—not at the Reformation, but before the Reformation—is very mixed once more. Take the Renaissance movement in Italy, and you observe the revival of an interest in art for art's sake, which in the absence of other inspiration is a very dubious standard; thus there were produced some very good things and some quite monstrous things. Again we come back to the suggestion in the decadent Roman architecture. People are ordered to put up buildings by some great civic or church authority, and they are ordered to ornament them in certain ways; not for the glory of God, but for the expression of human magnificence. In that they may run to all sorts of extremes, and thus we have the vagaries that are committed, even though they are checked and corrected by those who have a purer and larger conception of their art. Even amidst the corruption of the period there were those who began to develop standards of art for themselves, and to look at art as a conscious spiritual expression. However, from that time down, we see all manner of vagaries and all kinds of mixtures for the reason that western civilization was breaking up into self-conscious fragments. The further down we come and the more utilitarian man becomes, the more completely does he get at sixes and sevens in his architecture. The best part of it for a time really comes to be semi-domestic, namely, the mansions of the great feudal lords, now a landed aristocracy, who took a real interest in their feudal domain, and who wished to raise these worthy structures of theirs, great domestic castles and baronial halls in England and France and other places, which would be worthy of their power, of their position in society and the state.

Thus once more we notice that these things are, if I may use the expression, owned of nature. That is largely after all what gives such a marvelous attraction to some of the great country houses in England? It is their complete unity with their setting, with the surroundings, with the character and life of the people at the time, and that is the only true standard, I think, in the end.

I shall have cause to refer to that again, because I think we are coming back to that, and it is one of the hopeful signs of the present; but what I have to notice first is the very mixed era that comes between the great cathedral-building period and the present day, when people's ideas seemed to be so much at sixes and sevens, and the utilitarian spirit prevailed, the spirit which put up a structure to serve a purpose and thought any kind of a building was good enough. Some people, however, had further ideas. They seemed to say to themselves that it would be just as well to ornament that building, to give it a more graceful form, or something of that sort. Thus they came to apply ornament in an external and dead sort of a way to a building erected, with no aspiration that demanded the ornament, or that determined that this kind of ornament can be used and the other kind cannot; or that this atmosphere and this setting demands certain things, and that situation is utterly inconsistent with certain others. And thus we get those monstrosities in architecture where you have no end of work often, and great expense, but extremely little effect, or a negative effect. Coming down to our own country and applying some of these tests, what we find is the development nowadays of the imitative, the merely imitative feature; certain things in this building are admired, and other things in that building are admired, and the party who admires them seems to think it would be a good idea to combine these things together and make a structure of some sort; and thus we get freaks. The dwelling house is frequently designed as a very costly affair, and apparently no thought is given to the situation, the climate, or anything else in the appropriateness of the parts. The result is sometimes congruous, by matter of accident; and sometimes quite incongruous both in its interior and exterior, and in its setting. That was the characteristic feature of much of the architecture of America during the past century, except for people and architects who came over from Europe, and in the first generation produced here and there things that had some feeling and setting.

I have been very much struck with that in Ontario. In going about the Province I have come across houses with grounds attached where there

was clearly some attention paid to the location and the surroundings to make lite harmonious within and without. And when one comes to enquire why this was done, and why it has gone to delapidation since, one commonly finds that it was due to somebody who came out from the old country, quite frequently with no architectural ideas at all in the technical sense, but having been brought up amidst beautiful surroundings, having their appropriateness ingrained in them, wished to reproduce in some measure a similar setting in their surroundings here. But the second generation, not having been brought up in the same atmosphere, fell away from the old standards and allowed the place to go into decay. Many of these picturesque old places are decayed up and down America as well as Canada; and it is only recently that our architects have been waking up to the fact that there is something in appropriate combination. Now, out of that I wish to draw the further fact, which is so important in the social aspect of our subject, that architecture of all the arts is the most constantly educative, and it is educative in the very best and highest way, namely, in the way in which the savage was educated. Architecture is a constant presence, and when good it develops taste and appropriateness in the minds that respond to it, without any effort, simply because they come daily in contact with it. Let the mind be situated in any other region and it will have no such aspirations, as is shown in this very fact of the first generation being interested in realizing the ideas which they unconsciously received in a better surrounding, and the second generation neglecting them altogether. Later on we come to the development of wealth. Go out into the country and find a man who has made money as a farmer, and who decides to put up a house. When he looks about his farm for a location for that new house where does he put it? You can find by going through the country. He looks through the farm and says, "It would be a pity to spoil that field, it is a good wheat field; it would be a pity to spoil this other field, it is good pasture; but there is a rocky waste piece that has never produced anything; if I put my house on that it won't destroy any of the farm." He puts his house on the most miserable place on the farm, and that is commonly the end of it. If he goes any farther, he will, perhaps, put in a tree or two, one hedge of evergreens, beginning half-way back on the house, and coming down to the gate, and he may not even trim them. Now such a man has traveled away from contact with nature, he has been in a region in which the utilitarian factor alone has been dominating his soul; he has none of the spontaneous aspirations of the first men; he has none of their vivid religious fervor and feeling, but he is dominated by what will distinguish him among his fellows, and his house is a visible emblem of it.

Architecture must be social in the end, and even in a region where a man puts up a house such as I speak of, his wealthy neighbors catch the idea and they put up houses like it and treat them in the same way. Go up and down country roads and you will see the same type reproduced over and over again. It is difficult for the architects, and I am sure you sympathize with yourselves in that, to get a man to see that there is more in architecture than merely displaying his money, and keeping a kind of Holy of Holies, as some of them look upon it, in the front of the house which the owner enters on Sunday, when he gets his best clothes on. He goes in there and sits down in a stiff attitude, quite uncomfortable, passing a day there, because you have to occupy the room somehow, and Sunday is the most appropriate day for occupying it. That is partly what has dominated this country, but we seem to be coming to a better era, and it seems to come of the development of a wider interest among the architects themselves, and a wider interest in the builders. We notice it in the developments in the United States, particularly in the New England States, in the great movement towards the improvement of public buildings, in the formation of guilds of civic art, and the education of public opinion. There is a return to the feeling that after all there is something more in life than mere living. There is the association of a higher aspiration and of the fitting clothing of the ideals, and the educative feature that comes along with them. Thus, I think, we are on the turn, and it seems to me we should emphasize it. I am very thankful to find that the architects are banding themselves together, and are working towards public standards, that they are beginning to criticize professionally certain structures that are put up, and to impress on governments and millionaires, and other people who have money to spend, that it is necessary, not merely to build, but to build well; and by the appropriateness of the setting to get the buildings to be, as I said, owned of nature. Take the bridges of Britain, those stone structures, and see how finely nature takes hold of them; clothes and adopts them, making them some of the most beautiful features in the landscape; also how impossible it is for her to take hold of certain structures, and how she holds back from them. There is a feeling which I would just like to touch on a little before I close. Why is it that the savage and the civilized man alike—anyone, indeed, who has a spark in him that responds to nature—recoils in horror from a burnt region? Is there anything so desolate as a wooded region swept by fire? Yet why is it that the burnt region should not be as attractive as the most fertile and green? Why is it that tumbled rocks, caused by earthquakes, will give us quite a picturesque feature? We say that the latter is beautiful, and picturesque, while the other is desolate and horrible. Why is it? It is that there is registered in our nature, as a result of our contact with outer nature through ages, the notion of what is normal and natural, as distinguished from what is abnormal and unnatural. When the fire-swept region is grown up again, when the fallen trees have been covered by the mosses—because fallen trees, merely as fallen trees, are not objectionable to the view, and especially when moss-grown—then it is attractive once more, because again owned of nature. Our interest in nature, therefore, and our feeling for it, should be the artistic test. It is, after all, the ultimate standard in beauty, in appropriateness, in form and all that. Why is it that one line is beautiful and another line not? There is no explanation in philosophy or mathematics for that but there is an explanation in the appropriateness of the curves to nature, whence man derived his appreciation. Therefore, I say nothing in architecture, whether in civic beauty, or in the development of domestic architecture through the country, will live or give satisfaction permanently, as some of the ancient structures do, except it be owned of nature; that is, in perfect harmony with these primary conditions.

But in making it harmonious with nature, it will not do simply to imitate the past. There is no use in our imitating the temple of the Greek, or the temple of the Egyptian or the Assyrian. Why? Because we have not their point of view; we have not their special aspirations, we have passed that stage long ago, and we might as well say that the cathedral-building Christians should have taken the Egyptian type, or that the Egyptians should have developed the Christian type. No. Both these things are perfectly splendid in their way, because they properly express the aspirations and feelings of the people at the time; and there is no architecture that will stand, it seems to me, that does not do that. We have, to-day, surely enough life and vigor and high aspiration to find their own appropriate clothing and setting so that they will, on the one hand, be the expression of civic and social interest, and on the other hand, be owned of nature. I know of no direction in which our wealthy men, our millionaires and so on, can more wisely spend their money, if they have to spend it on themselves, than in building fine mansions. That is what redeems Britain from being a very commonplace country in many ways, with a horrible climate nearly half the year, and yet great men putting their wealth into the stately, beautiful country houses, with their surrounding parks, have redeemed the country and educated the people. The mansion of the wealthy man is not merely for him; it may educate the people, it may raise their standards. It may ameliorate the ideas of life in a thousand ways, for all the community as well as for the owner; even as regards the interior of it, for there our English relatives set us an example, too, because they have freely opened their treasures and their interiors to the public; that is, to people who can appreciate them and derive benefit from them. And it seems to me that it is the duty as well as the privilege of our modern architects to direct the architectural movement in America, and to give us something that will be at once social and the embodiment of aspirations, and hence educative as well. And so it is proper that architecture should once more associate with itself in a perfectly normal and natural way all the other arts that were so long divorced from it; mural decoration, and statuary, and all these things shall come in once more and be harmoniously developed. (Applause).

DISCUSSION.

Mr. Symons: Mr. President and Gentlemen,—It was only from my desire to hear some discussion on Professor Shortt's able lecture that I could be prevailed upon to say a few words this afternoon. Prof. Shortt has taken us back to the time when art was an unconscious element, a mere protoplasm, a microbe. I do wish that there was something that could not be traced back to that blessed microbe; we are always face to face with these fearsome quantities, and now, if you please, our beloved calling has been traced back to such weird ancestory! Some of you may remember the words of Sir Joshua Reynolds—"the end of all art is to make an impression on the feelings and imaginations." There is no doubt that the first call upon architecture, its first duty, was simply to house the body; simply to form such a protection for the services of life, or as might provide for bare necessity. These requirements were met, and during the process other necessities became apparent, those which Prof. Shortt has mentioned namely the natural instinct for the beautiful, the true, the awful and the sublime; these had likewise to be satisfied; and it is in the development and satisfying of these nobler attributes of our nature that architecture finds its outlet. And as he said, as soon as a man has amassed wealth he endeavors to build himself a home that shall not only be the home of a wealthy man, but shall express his feelings and aspirations; and the means he has acquired enable him to satisfy his taste for what is beautiful and true. And the same thing may be said of a city. As soon as a city becomes prosperous the citizens endeavor to see how they can make it beautiful. We hear very little about beautifying our city, opening up squares, avenues or parks in hard times or in times of growth; but in prosperity, when we begin to feel that it can be afforded, we commence to look beyond the mere animal and gratify the desires of our higher nature. Have we not a perfect example of that growth without intense individualism, which Prof. Shortt so rightly upholds—and which was referred to by our President this morning when he said that we do not want the intensely individual in architecture—have we not that spirit beautifully shown in the history of Venice? In Mrs. Oliphant's book, "The Makers of Venice," she writes: "Where are her authors? Where are her sculptors? Where are her great men? Where are her poets? You cannot find them; you meet them nowhere. Instead of the man who made her what she is, we find everywhere the great Venice herself, the center of all their aspirations, the mistress of their affections; erasing themselves, thinking of nothing but her glory." It seems to me that what is so degrading in our own profession is the absurd endeavor to be intensely individual—individual in design, individual in attacking the great problems of the age, individual in every portion of our calling. How seldom it is that we call in the aid of a sculptor, of a decorator, or the aid of a landscape gardener when we are endeavoring to plan large schemes. No, we think so much of our individual power; we can do it all ourselves; and are we in consequence very far on in the life that Prof. Shortt has outlined to us? I am afraid we are not. We should aim to lose our individuality in the love of our profession, of our city and of our country. We have in our midst monuments that are grotesque in themselves and exemplify what I am speaking of; we have beautiful bits of sculpturing with badly designed bases; we have interiors designed without any relation whatever to intended decoration. I think the note that I would take from both Prof. Shortt's lecture and the remarks of our own President to-day, is this: To endeavor as architects and as a professional body to lose ourselves in the endeavor to benefit the city, the country, architecture and art. How can we best accomplish this? Sir Joshua Reynolds was looked upon as a great plodder, as a great worker, perhaps more than as a great aesthetic in his art, and he sums up the cause of all his greatness in his last lecture before the Institute in saying: "If we are determined to excel as individuals or collectively, men must go to their work whether willing or unwilling, morning, noon and night, and they will find it to be no play, but on the contrary, very hard labor." I know we have a problem ahead of us to benefit ourselves and others by this losing of ourselves, and it is not play, it is hard work. I have much pleasure, Mr. President, in moving a hearty vote of thanks

to Prof. Shortt for his lecture. Personally I feel that it has cut out much new ground, and I am only able to make a few remarks that will open discussion by people here who are more fully able to lead them than I. (Applause.)

The President: We shall be glad to hear not only from members of the Association, but from visitors who have come to hear Prof. Shortt. It is not really necessary to have a formal motion in order to express our thanks to Professor Shortt, but as we have one we must have a seconder. Will Mr. Price, of Philadelphia, second the motion?

Mr. Price: I do not like to take up any time, as I shall take up some later on, but I desire to say that I have been extremely impressed by Prof. Shortt's address, though it did not bring to me the same message that it brought to Mr. Symons. It seems to me that we have drifted towards the time when the development of the interest of the individual becomes the highest good for the individual and for the crowd as well; art itself will lose that microbe sting when we understand that it is our best means of individual development; that art does not mean, as Sir Joshua Reynolds said—I cannot quote the words—something to be looked at or something to give great pleasure essentially, but a means of expression; and by expression and through expression a means of creation, because if you come to analyze civilization—at least modern civilization—it will appear, I think, that the essential part is development by the individual and through the individual; and if you come to examine the means by which development comes you will find that there are very few; in fact, that they narrow down practically to one thing (as far as I have been able to analyze it), and that is to create new work. It seems to me the man who goes to college, or goes through any other course of preparation or study, gets development only; even there, as he takes those principles and remakes them for himself, as he becomes a constructive thinker; and my plea is for the greatest possible expression of self in our work, not only the expression of self, as the architect, but the expression of our co-laborers in architecture; because we are not the whole thing in architecture by any means. If architecture existed only on paper then we should be it; but architecture does not exist, as architecture, on paper, but in the concrete; and only as we can push along our own development—that does not mean a development that fights with everyone else's development, because if it is really the best sort it is an aid to everyone else's development and I would push our own development to its extreme—then we should become the best social architects and do the best social architectural work. And only as we help our co-laborers in the work of architecture to express themselves in their work can we hope to have the best results in architecture. (Applause.)

The President: The thing that struck me particularly in Professor Shortt's address is this unsolvable problem—now is it that the untutored savage is capable of creating art and the untutored hayseed is not? They seem to be in the same position. Architectural art after all is but the simplest expression of the pure emotion which the creator feels in what he is doing; if it is a house that he wants to create, his creation has the domestic feeling; if it is a fortress, he emphasizes (for very good reasons) the strength of the fortress; if he is an Egyptian and wants to create a temple, it naturally takes the form of the emotions which he feels in his religion, and a long interior, more and more thickly columned, ends at last in the mysterious chamber where resides his god; if he is a Greek his religion requires but a little statue chamber, and he decorates the exterior of the building for his own aesthetic gratification. When he becomes a Christian architect, we find his plan and the whole expression of the building (as exemplified by the Gothic cathedral) expresses exaltation—the uplifting of the Christian mind. Architecture, then, is merely the expression of an emotion which a man feels when he desires the building which he proceeds to erect or the work which he proceeds to make. How is it that the man is not nowadays able to feel these emotions truly? To me it is a problem without solution. Perhaps Professor Shortt can give one. But there is this that seems to come out of it: that the modern architect cannot do too much to cultivate his mind. It seems to be the cultivated mind only which is able to express the emotion which results in a work of art. We have lost the simple feeling; we are not in touch with nature as men used to be and we can only get back to it. I fancy, by further development, not merely by education—at least not merely by information; it is of no avail for a man to have architectural draughtsmanship at his fingers' ends if he has not a mind that can use it to good purpose. The question is one of capacity for ideas: he has got to be in a position to feel what architecture indicates. He can only do that by not so much informing his mind as by cultivating it; he has got to have the capacity for feeling the right emotion, and this seems to be only possible to a man of truly cultured mind. The direct lesson which I think we may have from it is that we need not be at all afraid of cultivating our minds, for the more we do so the better we are able to appreciate the simplest problem that is set before us. (Applause.) I have great pleasure in presenting to Prof. Shortt the thanks of the Association.

Prof. Shortt: In acknowledging the vote of thanks, it seems to me that there is after all an essential harmony in what has been said. That while this is certainly an age in which the social development is to be expressed in the individual, we have to work out our social aspirations through the cultivation and development of the individual: and it is certainly, as Mr. Price said, by the creative factor. He struck a very true note there, to my mind; it is only creation that is great. Imitation is only a preparation for creation; it is only a cultivation of ourselves; creation is the great thing, and the man who is educated—at college or anywhere—and does not get to the creative stage, is a failure no matter how beautifully he can imitate this, that or the other. And with reference to the point dropped by the President. Why is it that the hayseed has not got that which the primitive savage has? It seems to me that it is explained by much of the tendency of our life, of this utilitarian spirit, to get us out of touch with the natural conditions. There is no reason in the world surely why the log houses of Canada should not have been as artistic as the log houses of Switzerland, or of Russia, or of many other countries that represent a race not nearly so well

developed as the people who built those log houses in Canada. It is simply due to the fact that a great many of them had lost the appreciation for the occasion; they thought that in having to build their houses of logs they had something that was utterly impossible of decoration or art expression of any kind; hence the ordinary log cabin house of Canada gives no creative expression. It is a mere box to cover the person from the weather; whereas this very material in dozens of other countries gets a perfectly beautiful expression; and in simpler and humbler form, many of them, than our log houses. It is that feature that the President indicated, which we have to work against; and to get ourselves back to the point of view of a large realization of where we stand and how we are to express it. Thank you, gentlemen. (Applause.)

Mr. Price: I should like to offer one other explanation of why the farmer's house is different from the savage's house, and that is, the savage builds his own house and the farmer does not. The farmer hires one of us to do it for him; and, while it might express him, it does not. I think the proof of this is found in the fact that the farmer's outbuildings and his barns are generally better than his house; they are at least picturesque; and what is more, they are built appropriately, which his house is not. You will find the only real timbering work we do is done in our barns, and our farmers do it for us. It seems to me we might even yet go to the farmer.

THE IONIC VOLUTE.

Discussing this question at a meeting of the R. I. B. A., Dr. F. C. Penrose said the origin of the volute had been sought for in Assyria, Egypt, and elsewhere. He derived it from Greece itself, as the scheme he would explain enabled the exact figure of any true Greek example to be reproduced. In archaic Greek work, and particularly in the decorations of the Mycenean period, one constantly found the form of scroll in which every convolution of the spiral followed the first at equal intervals. This decorative scroll had no doubt been formed mechanically, as could easily be done by unwinding a string from a cylinder, forming a figure known as the involute of the circle. The question presented itself, How could a spiral having the character of the ammonite be produced? If the operator drew upon wood—or some other suitable material—the involute scroll, such as he had been accustomed to, and by shallow carving or otherwise raised the edges a little so as to form a helix and allow a string to be wound around those edges, and then unwound over a flat surface having a marker at the extremity of the string, he would produce the expanding spiral he was in search of. It did not give correctly the figure of the ammonite, but it had all the requisites of proportional expansion and perfect variation of curvature at every point, and coincided perfectly with Greek volutes.

The author gave two examples from Ephesus—the first from the archaic temple of Diana. In all later examples known to the author the two central convolutions of the spiral, or nearly so, were interrupted and concealed by the circle which formed the eye of the volute. In this case, however, the curve which would be evolved from the helix was allowed to extend from the central origin of the volute up to its junction with the abacus. By drawing a straight line through the central origin to the circumference on both sides, a calculation could be made to find a helix on the involute principle and this, when worked out, would be found to agree not only with given points on the circumference, but to correspond with the inner convolutions also and could therefore be extended to the whole of the volute. This correspondence clearly showed that the method of the involute spiral was that which was used by the architect employed by Crœsus. The volute of the later temple at Ephesus, the second example, had almost the same curvature, the only difference being in the surface moulding and the circular eye which occupied its centre. In the majority of the examples known to the author the eye of the volute was a separate piece from the main mass of the capital, and was formed by some kind of boss of marble or metal inserted into a circular hole prepared for it, centred very nearly on the place of the pivot of the helix, and always of sufficient diameter to receive it. Such an arrangement would have had obvious convenience for fixing the helix.

The volutes in all the examples in Asia Minor were probably described by means of helices similar to that mentioned above. But the Athenians demanded greater variety than that spiral so used could supply, and gave to their volutes additional expansion in the exterior convolution; still, however, working so by means of the involute form, but differently treated. This applies to the Propylæa, to the three orders of different size in the Erechtheum and to the temple of Nike. It was also used in the temple on the Hyssus, recorded by Stuart; and in the provincial temple at Bassæ. With the exception of this variation in the exterior convolution in Athenian structures, the same general scheme seems to have been employed in all true Greek examples, and the only liberty of choice given to the designers lay in the proportioning of the width of the volute to the upper diameter of the column and in that of the interval between the convolutions of the generating helix, in the size of the eye compared with that of the volute.—Architects' Magazine.

SOME SUGGESTIONS FOR YOUNG ARCHITECTS

Under this title Mr. A. A. Symon, President of the Dundee Institute of Architecture, Science and Art, in a recent inaugural address said that most lads who entered the profession did not do so for the purpose of making money. If anyone was foolish enough to harbor ideas of that sort he would not be very long in being disillusioned. Entry into an architect's office involved much hard work, but the prospect was not such as should discourage any young man. An apprentice's first duty was to keep his eyes open. He should be ever on the alert, and ready to improve his time, for deficient powers of observation always resulted in failure. They should never be afraid of displaying their ignorance. They were all learning, and it seemed to him so many things went to make up an architect's education that it would be impossible to acquire them all in a lifetime. He deprecated the present-day system of young men making football and recreation the business of existence. He advocated at this stage of an architects' career the closest attention to study, and counselled the younger members of the profession to avail themselves fully of the classes at their disposal. On completion of his apprenticeship an architect should seek employment in some other large centre, and there watch the methods of other people. When he suggested this course, however, he did not mean that they should remain away. There were as good opportunities at home as in other large centres. He advised every member to gain some practical knowledge of materials, as such would prove of great value in his professional life.

The London Lancet tells of a peculiar "disease" that has attacked the glass in the windows in York Cathedral. The glass is of the thirteenth and fourteenth centuries, and some pieces have become finely perforated and have lost their transparency. In fact they seem to have lost all the properties usually associated with glass. The Lancet also discusses the power of water and articles of food to dissolve glass and the prospects of consequent diseases.

INTERNATIONAL FIRE PREVENTION CONGRESS.

This Congress, convened by the British Fire Prevention Committee, is to be held in London, July 7th to 18th next.

The Congress will sit in General Congress and also in Sectional Congress. There will be six sections as follows:—I. Building Construction and Equipment; II. Electrical Safeguards and Protection from Lightning; III. Legislation and Adminstration; IV. Fire Survey and Fire Brigade Patrols; V. Insurance and Fire Losses; VI. Standards and Tests for Materials.

The primary objects of the Congress, among others are as follows:—

I. To discuss the practice of building construction and the application of building materials from a fire preventative point of view; to compare the practice in different countries, and to inquire into the latest materials and systems of construction available, as also the latest inventions for the general equipment of buildings.

II. To discuss the equipment of buildings particularly in relation to the application of electric power and electric light, and to receive the views of electrical engineers and fire brigade officers as to the origin and prevention of electrical fires, including fires caused by lightning.

III. To discuss the legislative enactments in force in cities and districts, particularly in respect to the limitations of area or cubical contents for warehouse buildings and workshops, and the means of separating and uniting such buildings, also the means of escape in case of fire; further, to consider particularly the regulations governing the construction and control of theatres and places of public resort, and the provision of staircases and means of escape for the audience and employees; as also the regulations governing the construction of dwelling-houses and houses let in tenements, and the amount of fire-resistance to be provided and the means of escape in case of fire.

IV. To discuss the best means of watching or inspecting buildings and plant exposed to fire risks without due inconvenience to owners and occupiers, the practice of fire brigades in this direction, and the experience of the various fire patrol systems.

V. To discuss the practice of insurance against fire; to ascertain the systems adopted in various countries; the risks insured against; the regulations and requirements of the national, municipal, public and private insurance corporations, and to inquire into the systems of mutual insurance, the precautions taken against incendiarism, the statistical record of fire losses, and the preparation of uniform fire maps and plans.

VI. To discuss the best means of recording the causes and effect of fires, and tabulating the results, so that a basis for comparison may be obtained and standards compiled for various degrees of fire resistance required in different buildings and suited for various materials; to discuss the best methods of testing materials and recording the facts of such tests for the information of those engaged in the construction, use and protection of buildings from fire.

The Parkin & Somerville, Elevator Co., whose announcement appears on front cover of this number have recently commenced the manufacture at Hamilton, Ont., of elevators for all purposes, and have successfully carried out a number of contracts in this line.

Mr. Edmund M. Wheelwright, the well-known architect of Boston, recently delivered an interesting lecture illustrated by lantern slides in the Art Gallery, Montreal, on "Bridges." The lecturer traced the history of bridge construction from the time of the Romans, and pleaded that greater attention should be paid here as in Europe to artistic effect in bridges.

The richly decorated west front of the cathedral at Exeter, England, is to be remodeled in the interests of safety, the seven centuries old wall having shown signs of collapse. As much of the statuary as possible will be retained in the remodeled wall, and the remainder will be carefully copied and restored. The famous cathedral was begun in 1280 and completed in 1371, the west front being finished last.

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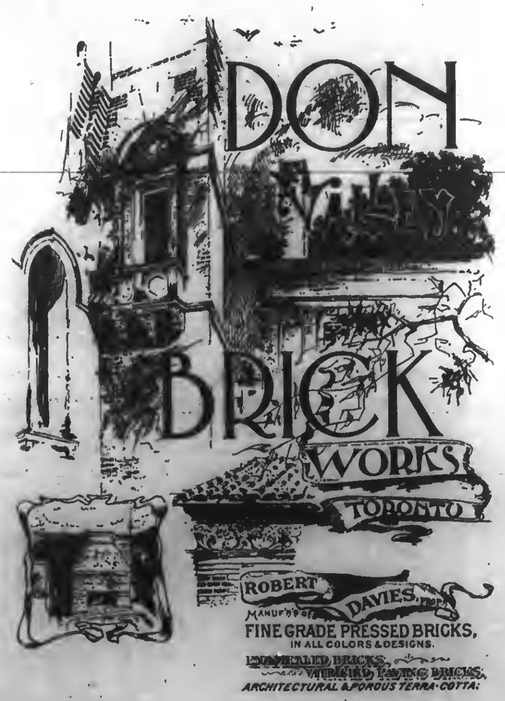
BUSINESS NOTE.

The Frink system of reflectors is the best for lighting pictures in galleries and private houses and is coming more and more into use. The Frink Company have recently completed the installation of their reflectors in the American Art Galleries New York, also in the new galleries of the Drexel Institute in Philadelphia and have just finished putting them in the delivery room of the Boston Library for the purpose of lighting Mr. Abbey's "Holy Grail" decorations.



THE DECORATION OF CEILINGS.

An authority upon the subject of interior decoration has expressed the opinion that if only one part of a room be decorated, that part should be the ceiling. He says:—"Nothing appears to me more strange than that our ceilings, which can be properly seen, are often white, while the walls, which are always in part hidden, and even the floor on which we tread, should have color and pattern applied to them; and of this I am certain, that, considered from a decorative point of view, our ordinary treatment is wrong."

A ceiling may be an object of great beauty, and it can be seen as a whole, therefore in many public buildings the decoration of the ceiling might be very advantageous.

If a ceiling be quite flat and without raised mouldings or ornaments, all decorations placed upon it must be flat also, and must not represent fictitious relief, for no shaded ornament can be satisfactory when placed as the decoration of a flat architectural surface.

Many circumstances tend to determine the nature of the decoration to be applied to a ceiling; thus, if a ceiling be structurally divided into square panels, the character of the ornament is thereby restricted, and should these panels be large it would probably be desirable that each be filled with similar ornamentation; while if they are small, three or four different patterns may be employed, if arranged in some orderly or regular manner.

On the Continent, and to some extent in this country, ceilings have been painted with large pictures, covering the whole or a portion of the surface; but this is quite a wrong method, for a picture of such a kind could only be seen the right way up, from one point in the room; from all others it would be viewed upside down, or from one side or corner.

But apart from this, a ceiling being flat surface, all decoration upon it should be flat also. In many of the French ceilings the picture is painted in such a position as to be seen properly only by a person standing with his back to the fire.

The Egyptians decorated their ceilings, so did the Greeks, the Byzantines, the Moors, and the peoples of the Middle Ages, and the ceilings were by no means always of a light colour. It is remarkable that so few of our public buildings contain rooms with well decorated ceilings, but there have been more executed during the last few years, and there appears to be a tendency for their adoption in connection with modern buildings.

Architects and building owners should be interested in the announcement on page i of this issue of the Smith-Warren Co., of New York. The company manufacture the "Smith" system of metal window frames and sashes for holding wired glass. These windows have proved to be an efficient protection against fire and are accepted by the Underwriters in lieu of fire shutters. All moveable sashes, whether sliding or swinging close automatically at 155 degrees of heat. The sliding sashes are also made for cleaning from inside of building. As a means of reducing the fire risk and thereby lowering cost of insurance these windows are worthy of consideration and trial.

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PERSONAL.

Mr. J. Greenfield, architect, has removed his offices to Room No. 24, Canada Block, Winnipeg.

Mr. Thos. Kennedy, after an absence of three years in the Northwest, has returned to Barrie, Ont., and resumed his architectural practice.

Mr. A. W. Peene, architect, has recently filled the position of superintendent of the Hamilton Art School, pending the appointment of a permanent superintendent.

Mr. Ebenezer North, a prominent contractor, and one of the oldest residents of London, Ont., died unexpectedly of heart disease in that city on the 14th inst. The deceased was born in Lincnolshire, Eng., seventy years ago.

Mr. A. J. Cooke, architect, of Montreal, died at his residence at St. Lambert, on Feb. 23rd, from hemorrhage of the lungs. Mr. Cooke was a Londoner by birth and was apprenticed there by Mr. Andrew T. Taylor, F.R.I.B.A., coming out to that gentlemen's Montreal office in 1883. For some six years he was with Mr. McLea Walbank and then started in practice for himself. He was well-known, especially in Westmount, where he built upwards of one hundred houses.

An artistically printed booklet referring to the manufacture and uses of Portland cement has been published by the Canadian Portland Cement Co., Limited. It contains numerous illustrations of works in which the company's material was employed.

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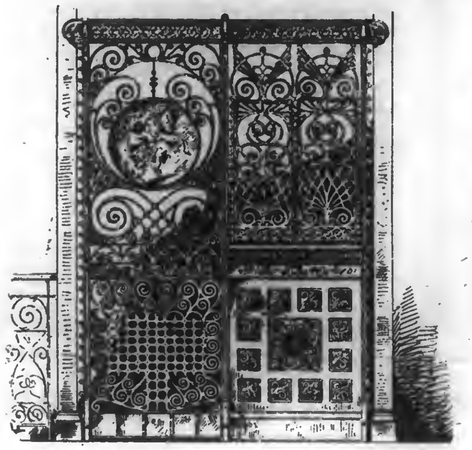

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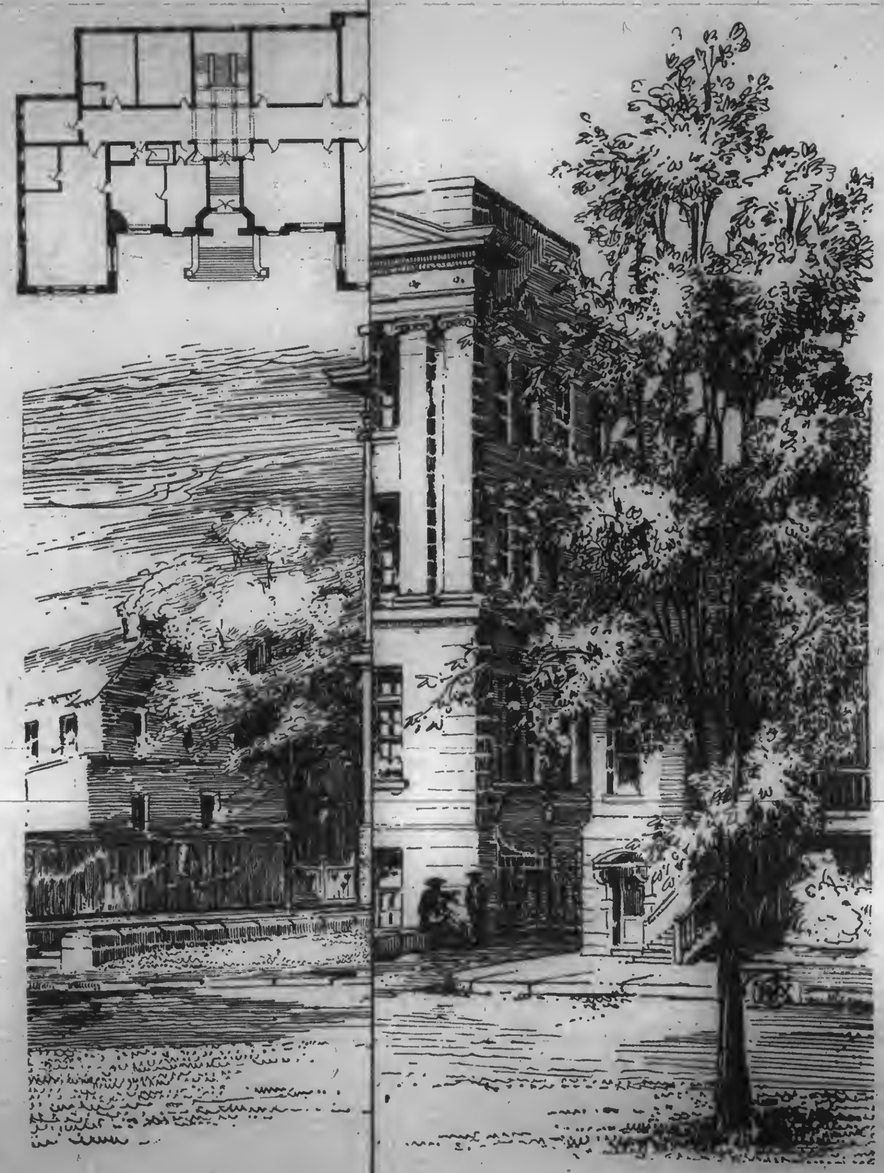
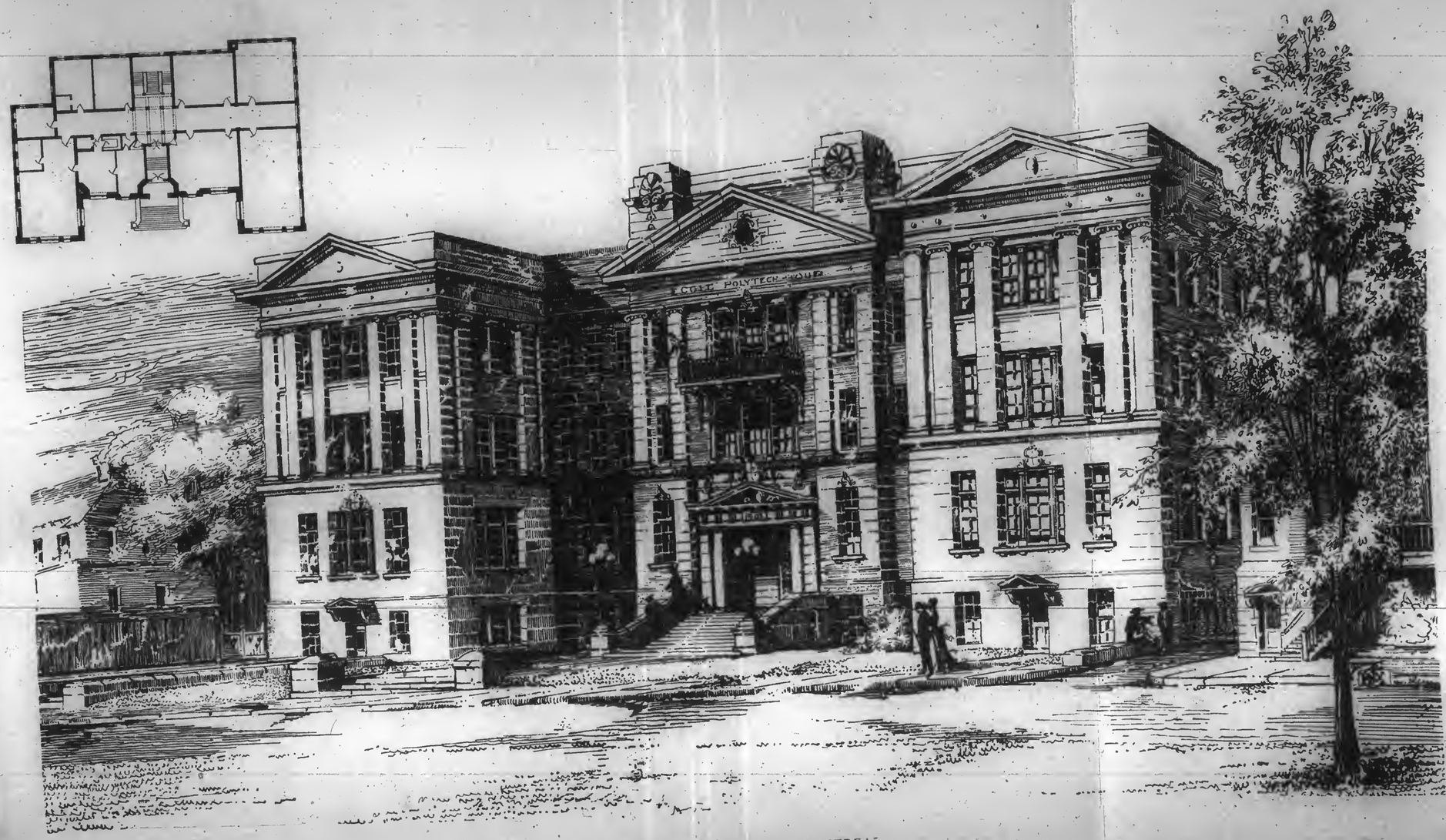


SUPPLEMENT TO CANADIAN ARCHITECT AND BUILDER MARCH 1903



POLYTECHNIC SCHOOL, MONTREAL.

J. E. Vanier, Architect.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
MARCH 1908

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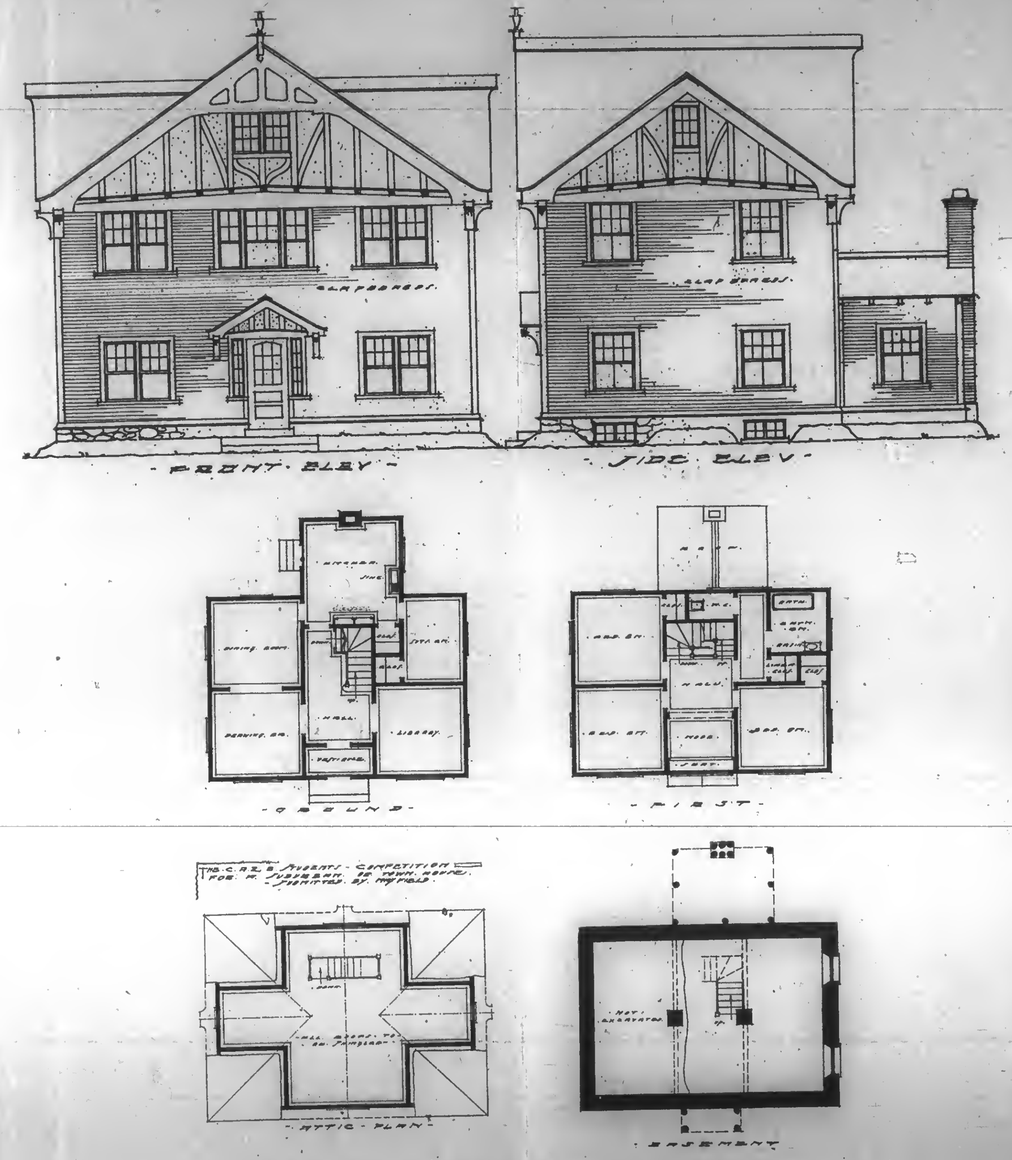

C. A. & B. Students' Competition for a $2,500 Town or Suburban House.
Design Placed Third, by "Mayfield" (Geo. C. Egg).

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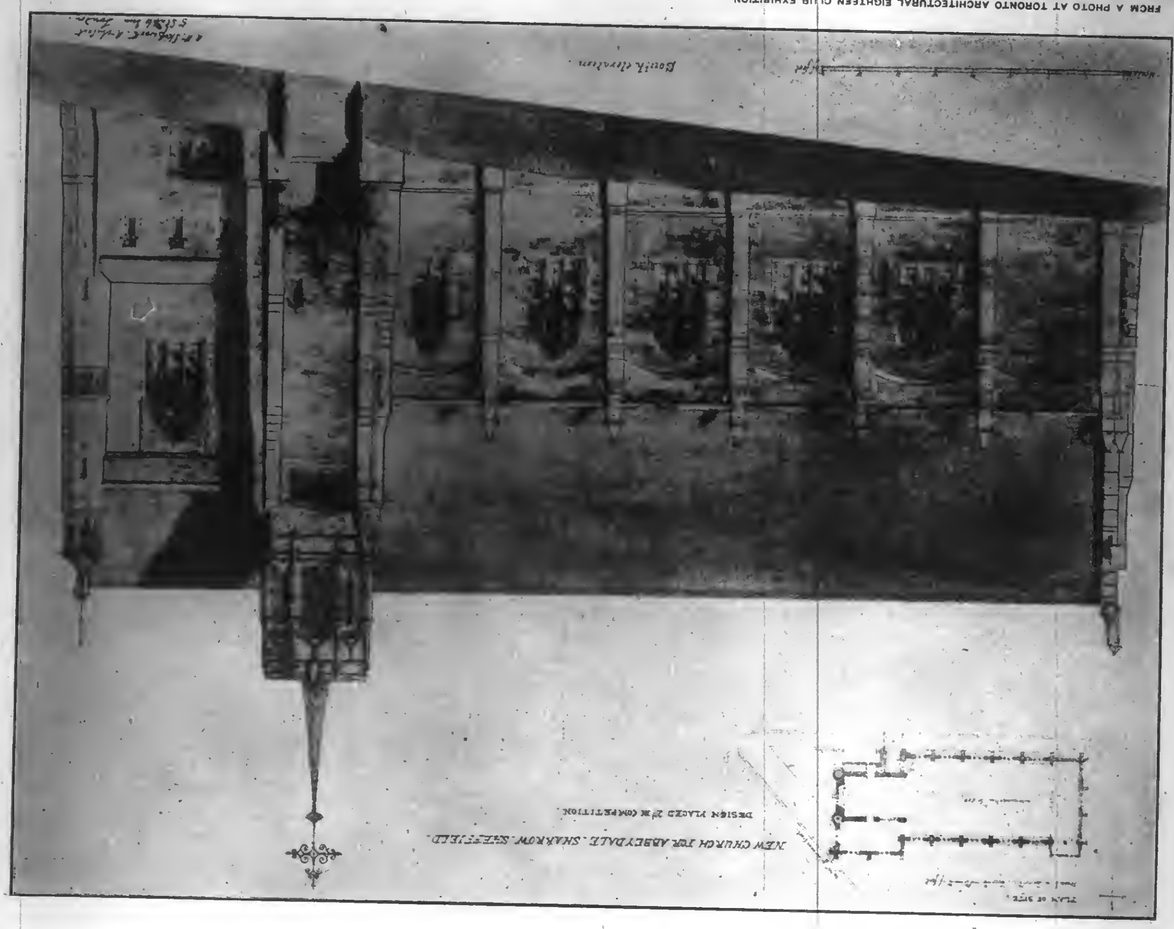
MARCH, 1903

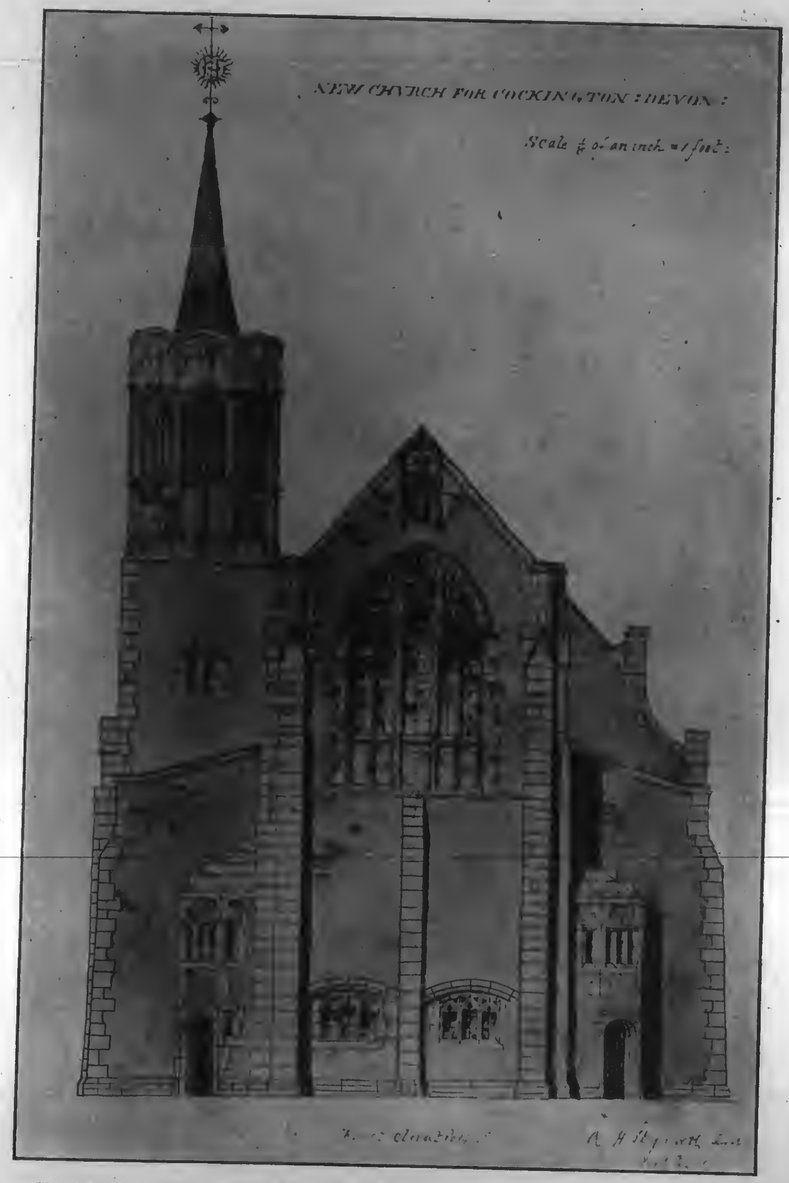
SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
MARCH, 1903

CHURCH AT ABBEYDALE, SHARROW, SHEFFIELD, ENG.

A. H. SKIPWORTH, ARCHITECT

FROM A PHOTO AT TORONTO ARCHITECTURAL EIGHTEEN CLUB EXHIBITION





FROM A PHOTO AT TORONTO ARCHITECTURAL EIGHTEEN CLUB EXHIBITION

DESIGN FOR CHURCH IN DEVONSHIRE
A. H. SKIPWORTH, ARCHITECT

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
MARCH 1903

The Canadian Architect and Builder

VOL. XVI.—No. 184. APRIL, 1903.

ILLUSTRATIONS ON SHEETS.

C. A. & B. Students' Competition for a Town or Suburban House.—Design submitted by "T Square, Jr." (Mr. Clarence Thetford), Awarded Honorable mention.
House in Park Road, Toronto.—Burke & Horwood, Architects.
Entrance Gateway, Upper Canada College, Toronto—Symons & Rae, Architects.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Detail, Certosa di Pavia, Italy.
Old Building at Chinon, France.

ILLUSTRATIONS IN TEXT.

Buildings under construction for the Louisiana Purchase Exposition, St. Louis, Mo.
Decorative Panel for a Dining Room.

CONTENTS

Editorial	53-54	The Nova Scotia Freestones	65
High Building	55	Men Who Build a Sky-Scraper	67
By the Way	56	Advertising Value	68
Intercommunication	58-59	British Brick Standards	ix
Methods of Construction in Relation to Insurance	60-61-62-63-64	Portland Cement Affected by Time	x
		Legal	

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" J. C. B. HORWOOD, Architect, Toronto.
" A. F. DUNLOP, R.C.A., Architect, Montreal.
" FRED. T. HODGSON, Architect. Collingwood, Ont.

Putting in Foundations in Winter.

For several years in Toronto there has been but a very short gap between one building season and another. In fact, if account is taken of the new structures on which inside work is in progress throughout the winter, there may be said to be no gap at all. The present winter, which has been a favorable one for architects and builders, witnessed the putting in of foundations for new buildings during January and the early part of February. The method adopted to prevent frost from getting in below the foundations is to cover the work when not in process of construction, with manure. It is admitted, however, that there is considerable risk attending the practice—the success of which largely depends on securing a week or ten days of favorable weather. We have been told of instances in which frost having got below the footings of a cellar pier, caused the architect trouble from settlement throughout the whole progress of the work.

Building Failures.

The Montreal papers have already recorded this year several instances in which buildings in that city have collapsed. Such cases have been altogether too frequent in Montreal during the last three or four years. In some instances, as in the case of a biscuit factory on Delorimer Avenue last month, the collapse came while the buildiag was in process of construction. In others, the buildings had been standing for years, and probably succumbed to strains imposed on them which they were never intended to bear. In the case of the uncompleted buildings the explanation is not so clear. Their collapse would seem to be due either to faulty materials or construction or to carelessness on the part of contractors in failing to properly support the unfinished walls. Whatever the cause, greater care should be exercised lest human life be sacrificed, which through good fortune rather than good management, has not yet occurred.

Slip-Shod Tendering.

An inspection of a batch of tenders, even for an ordinary house, will show the necessity for a better all-round education and in particular a better business training, for contractors. It is evident that many contractors do not study and grasp the meaning of the specifications on which their tenders are based. The specifications may in the most explicit manner require the contractor to state what deductions in price he will make if certain parts of the work are omitted, but as a rule he pays no attention whatever to the requirement and it is impossible for the architect to know whether his tender is designed to

include the whole work or not. Then there is the wide variation in tenders to which previous reference has been made. Tenders for the carpentry work of a house of moderate price are found to be as much as one thousand dollars apart, and even in so small an item as the electric wiring, there is a difference of fifty dollars between one offer and another. There would seem to be something radically wrong either with the methods or morals of contractors when such wide differences as these occur, and in view of such apparently hap-hazard figuring it is surprising that the percentage of failures among contractors is not greater than it is.

The Designing of Commercial Buildings.

The Confederation Life Building, Toronto, is serving as an example of the unsuitability of gothic design for commercial buildings. In order to secure an adequate revenue the owners were compelled two or three years ago to have remodelled the western front, to serve as banking premises. With the same end in view it is now proposed to redesign and reconstruct the upper part of the Yonge and Richmond street fronts as far back as the main tower and to add three stories to the height. When this is done the revenue from this part of the building will probably be more than double what could have been obtained before. The alterations will represent a large expenditure, the greater part of which might have been saved if the purpose of the building and its revenue producing value had received proper consideration by the designer and those responsible for the selection of this particular design from among a large number submitted by architects in competition. Architects, owners and judges in architectural competitions should alike be impressed by the lesson which the history of this building teaches—that a plan for a building is successful in so far as the requirements are properly considered and provided for. Following this in order of importance should come the effort to make the building pleasing in appearance, which with a skilled designer is always possible.

Dominion Exhibition.

Assisted by a grant of $50,000 from the Federal Government, it has been decided to hold a Dominion Exhibition in Toronto this year. For some time we have advocated this project, and are therefore gratified to learn that it has assumed definite form. The question arises however, whether four or five months is sufficient time for the preparations to be made on a sufficiently ample aud complete scale. It is stated that the Industrial Exhibition Association have already been at work on the enterprise for several months. If this is the case, no douht many of the arrangements are already well under way. Every patriotic Canadian should lend his assistance to make this Exhibition truly representative of the resources of the entire Dominion. The hearty co-operation of the local governments, commercial bodies and leading men of the various provinces forming the Confederation, is essential to success. The railway and steamboat companies can also greatly assist by granting such low transportation rates as will encourage visitors to attend from every part of the country. It is to be hoped that means will be found and steps taken to bring before the visitors to this Exhibition the improvements in design, materials and methods which have marked the progress of the building industry in this country, especially during the last decade.

An Important Decision

Consternation has been caused in the ranks of the labor unions in England by the recent decision of the Superior Courts, condemning the Amalgamated Society of Railway Servants to pay $115,000 to the Taff Vale Railway Co. as compensation for damage sustained by the company by reason of the intimidation of their employees by the Society during a strike. In this case, as in that of the journeymen plumbers in Toronto last year, the strikers did not hesitate when it suited their purpose to violate their agreement with their employers by quitting work without giving fourteen days notice as required by the terms of their engagement. The secretary of the Society has admitted that had the Society lived up to its agreement, the strike could not have succeeded, as the company would have been able to get the required help. When the company were granted an injunction preventing interference by the strikers with their workmen, the society capitulated. Then the company took the agressive and sued the society for $150,000 damages, and as stated, were awarded $115,000. The situation in England now is that men still have the right to organize, but they may not strike until they have given the legal notice, and when they have quit their employment they must not interfere with the men who take their places. If they do they are liable in damages, and as the present decision shows, substantial ones at that. An effort is now being made to have the law changed in such a way as to relieve the Unions of the responsibility placed on them by the courts.

Wired Glass.

The Chief Engineer of the New York Fire Department has recently expressed high appreciation of wired glass as an efficient protection from fire. The fire-resisting qualities of this material are now generally recognized. According to the American Architect, however, except when fire is present, it has undesirable, even dangerous qualities. This journal cites as proof the South Terminal Station in Boston. In the windows that face east, south, and west, and in the thousands of feet of pent-roof over the street sidewalks, there is said to be hardly a sheet of the glass that is not cracked and shivered into a dozen or a hundred different pieces of glass, just now held in place by the embedded wire and the unequal planes of fracture of the glass itself. But where cracks are, there moisture and acid-gases can penetrate, and when corrosion has done its work on the wire there is likely to be many a repetition, less innocent, too, of the incident which attended President Roosevelt's reception in Boston a few weeks ago, when a sizable piece of this shattered wire-glass fell onto the platform not far from the President. Meanwhile before the time comes when falls of heavy pieces may be looked for, much of this shattering of the glass is already accompanied by the flying of fine splinters of glass. As fracture occurs least often on the side, and most frequently where the windows face the rising sun, it is evident that the manufacturers must give further study to the qualities of radiant heat before wire-glass can be held to be a perfectly safe material to use.

TOM MOORE HOUSE AT STE. ANNE, NEAR MONTREAL.

HIGH BUILDING.

It is satisfactory for the rest of the world that New York should proceed as fast as it can to the logical extreme in high building. What the rest of the world wants to know is, what will it come to? What is the limit; and what are going to be the consequences of building up to the limit?

The limit in height is practically in sight. Passenger elevators, which were the generating factor in these buildings, are also fixing their limitations. Accessibility to the street level is what is required for an office; and, when buildings are so high that time is wasted in going and coming in the elevator, the offices in the highest floors will not rent sufficiently well. The device of express elevators gets over the difficulty to some extent, but in the first place there is a limit to the percentage of floor space that can be given up to the elevator shafts, if the building is to pay; and in the second place there is a speed limit in elevators. What is known as a "nausea limit" is recognized; anything above this rate of speed is found to be uncomfortable—at least for landsmen. For men this rate is said to be 720 feet a minute; for women not more than 600 feet; and the descent must be much less rapid than this. Anything faster than 400 feet a minute going down, is distressing; so that about 600 feet per minute up and 400 feet per minute down is the maximum for an express elevator. The floor to floor elevator is still further reduced in speed, to enable the operator to make a prompt stop. If, with higher speed he bobs up and down at every floor—a consequence partly of human weakness and partly of the elasticity of steel rope—there is no ultimate gain in speed and considerable waste of power. Limiting calculations are often upset by new inventions; but, where the human body is the measure, there is a standard which may be relied on not to change. It is difficult to conceive of more rapid motion up or down for human beings than the present nausea limit, or of more abrupt stops at this rate of speed without great discomfort to the occupants of the car; and we may therefore accept as a scientific datum the present opinion of engineers in New York, that the limit of business buildings due to the limited speed of elevators, is between twenty-five and thirty storeys.

This may be the limit of height, but how to fix the limit of continuity. A sky scraper at intervals is a gain in every way; it gives well lighted, airy, and quiet offices; and it makes the street picturesque. A row of sky scrapers converts the street into a box canyon of unwholesome gloom; but it is not to be compared to the gloom and unwholesomeness within the buildings themselves. This condition of affairs is rapidly approaching in New York. There is what almost amounts to a skyscraper war going on. The early tall buildings in which, with more confidence than judgment, the party walls were filled with windows, are now in an awkward position. Skyscrapers are rising beside skyscrapers and blocking up whole walls of windows. Rooms which, when the buildings were erected, had the winter sun and the summer breeze, are now sealed up in darkness forever; and the sanitary consequences are beginning to cause alarm. In the lower rooms, in a street of continuous sky-scrapers, there is no light anyway; and, if darkness is to invade the upper storeys too, the unwholesomeness of the overcrowding in these expensive offices is going to be as bad as that in the poor tenements, which so much effort has been made to stop. At a recent meeting of the Municipal Art Society, a prominent speaker said:

"I read in my newspaper to-day of the benevolent project to build a great hospital for consumptives, the victims of tuberculosis; where they may have air and sunlight. And in the same paper I read of plans for a thirty story building. What are we trying to do? What do we mean by putting up these horrible structures, to the lower floors of which no light can ever penetrate? . . . We build hospitals for the poor consumptive, and then we turn around and erect skyscraping structures where consumption may breed, so that we shall not lack for patients."

It is not merely the darkness, but the crowding of the streets and buildings which is a menace to health and safety. This same speaker calculates that "when Broadway is lined with these structures, there won't be room for the tenants, unless they are packed horizontally thirty feet thick." It is not hard to believe that this calculation, if checked, will be found to be not far from the truth. It was calculated at the beginning of the year that the buildings of nine storeys or more in the lower part of Manhattan Island, below Leonard street—that is to say only in the tall building district proper—have added the floor area above their fifth storeys, 180 acres of area to the island. The estimated cost of these buildings was $33,000,000. There is said to be $10,000,000 worth of buildings of the same sort in process of erection now, so that, as area may be presumed to compare consistently with price, when these are completed, which will not be long at the rate these buildings go up now, there will be added to this small district 240 acres of standing room above the streets; but there will be only the same old streets to walk in, and these more than ever filled with vehicles from other parts. The Broad Exchange Building has a floor area of 12½ acres and a normal population of 4,000 persons. Apply this rate of population to the 60 acres or so of floor area (above the fifth storey) which are now being constructed and it will appear that this portion of New York is about to receive an increase in daily population of at least 20,000 souls. If they only were souls; if, "in going from place to place," they need not "pass through the intermediate space," it would be all right; but 20,000 hustling bodies in streets where one has already, in going to keep an appointment, to allow time for hindered progress—it is nearing the limit.

The cure is exhibited in a trio of buildings on Broadway; a two-storey bank between two sky-scrapers. This is, at any rate, the solution of the light and air problem. It would also solve the problem in design. The two storeys of the bank run with the two storeys

which constitute the base of the tall building; the bank's cornice with the top member of this base; their columns and arcades are fairly comparable. Here is dignity without monotony, picturesqueness without extravagance, height without gloom; every gain without any loss except loss of space, and loss of space is gain in this case.

What other cities have to learn from New York is to put the limit out of the question by taking precautions in time. The limit is not practical. It is not worth while to shut numbers of people in darkness, for the sake of getting them all together, only to find that it would be better if there were not quite so many together. The limit of elevators, and the limit of traffic and transit in the streets, seem to point to the same moderation in close building which is indicated by the requirements of planning for light. It is no extreme to advocate the attainment of this moderation by municipal regulation, requiring that every tall building shall be isolated above such height as usually forms the base storeys of a sky-scraper. This allows for such an arrangement as is suggested by the bank on Broadway between two such buildings. It would make a satisfactory street effect if the cornice at this height were continuous and the sky line above broken at intervals, more or less regular, by buildings more or less tall.

A way to bring this about would be to require every high builder to isolate his upper storeys by the purchase of land sufficient for the purpose. This would not be tyrannical legislation. If any criticism is to be made of it, it might be called grandmotherly legislation; for it is looking after the interests of the high builder himself to compel him to guard the value of his building in this way. It is not however entirely grandmotherly, for the interests of the public are also guarded in matters for which it is certainly within the province of the City Fathers to care, viz., light and air and reasonable density of population. There is also plenty of precedent, in cities which owe part of their success to regulations of this kind, for requiring that the low part of the building shall have for æsthetic considerations, a cornice line of a fixed height.

W. A. LANGTON.

DECORATIVE PANEL FOR A DINING ROOM—G. A. REID, R. C. A.

Messrs. King and Bannigan, of Boston, are reported to have purchased a large plaster quarry at Hillsboro, Albert county, N.B., and to be making arrangements to open up the work and to prosecute it in a vigorous manner.

The Lake Manitoba Quarry and Transportation Co. has been formed to develop extensive deposits of excellent building stone at the Lake Manitoba Narrows.

BY THE WAY.

There are said to be within the limits of the city of New York two hundred thousand inner rooms unprovided with means of ventilation. To this cause is largely attributed the increase in the number of consumptives.

× × ×

The inconvenience arising from lack of uniformity in size of bricks is evidently not confined to Canada. A petition has been presented to the legislature of Massachusetts praying that the standard for face bricks shall be fixed at 8⅜ by 4¼ by 2¼ inches and for common brick at 8¼ by 4 by 2¼ inches.

× × ×

Recent excavations in the far east have revealed the fact that the Jerry builder had to be reckoned with one thousand years before the time of Moses. The following has been found among other enactments of a Babylonian ruler of that period:—"If a builder build a house and finish it, but does not make it solid, and if then the house fall and kill the owner, that builder shall be put to death. If it strikes the owner's son dead, then the son of the builder shall be put to death".

× × ×

The Deputy Chairman of the Liverpool Corporation Housing Committee thinks he has solved the problem of the cheap and substantial construction of dwellings for the dispossessed slum population. He proposes to use very large slabs of concrete made from refuse-destructor and clinker cement, hoisted into position and bolted together. A quicker and therefore cheaper method than this would be the plan attributed to Thomas A. Edison of pouring the concrete into a mould of the desired form.

GLASS-FACED BRICK.

The Cleveland Leader says that a new company has been organized lately to manufacture glass-faced brick. A number of prominent Cleveland men are financially interested in the project and the concern is looking for a factory site of from three to five acres.

The new brick is another of the great variety of concrete building material now being manufactured. A glass plate is laid in the bottom of a mold, and the concrete mixture is poured in on top of the glass. The concrete hardens on the glass, thus forming a brick or building block with a very brilliant exterior.

This kind of brick is for use in such places as courts and light wells in large buildings, where the glass becomes a reflector, and on account of its smooth surface does not become soiled easily, and is readily washed. The new process will yield a product similar to enamel brick.

BUILDINGS UNDER CONSTRUCTION FOR THE LOUISIANA PURCHASE EXPOSITION, ST. LOUIS, MO.
No. 1, TRAVELLERS' PROTECTIVE ASSOCIATION BUILDING. No. 2. LIBERAL ARTS BUILDING. No 3, FRATERNAL BUILDING.

INTERCOMMUNICATION.

Communications sent to this department must be addressed to the editor with the name and address of the sender attached not necessarily for publication. The editor does not hold himself responsible for the expressions or opinions of correspondents, but will, nevertheless, endeavor to secure correct replies to queries sent in. We do not guarantee answers to all queries, neither do we undertake to answer questions in issue following their appearance.]

"Manitoba," Winnipeg writes: In your issue for this month "City Builder" complains of smells from the drain. I think he will find this comes from the inlet to the so called fresh air pipe outside, and does not necessarily mean any defect in the plumbing work. Let him put his nose in the fresh air inlet whilst some one lets off a charge of the water closet and I think he will find an outrush of the offensive gas complained of which would show the house drains to be foul. Let him then put a teaspoonful of "Permanganate Potash" crystals into the closet tank, flush down same once or twice and in about half an hour test the fresh air inlet again, when he will find the outrushed air to be sweet. The Permanganate Potash should be applied occasionally and I know that this has remedied several bad cases. Stinking gas forced out of fresh air inlet will blow into the house when windows are open. The Permanganate Potash has been bought here as low as 35 cents per lb. so that the annual cost for house for its use should not be very great.

From "Young Carpenter"—I am going out to settle in New Ontario, and expect to have several frame barns to build, and would like to know of the latest improved methods of framing timber barns. A sketch of an end "bent" would help me very much, giving size of timbers, pitch of roof, and such other details as may be useful?

ANS.:—The elevation of timber barn shown in Fig. 1, is about as good an example of frame barn building as we know of. This plan is useful where it is desired to have the lower floor or ground all clear, for example, for a wagon-house. The plan also serves quite as well as under other circumstances. The frame makes a

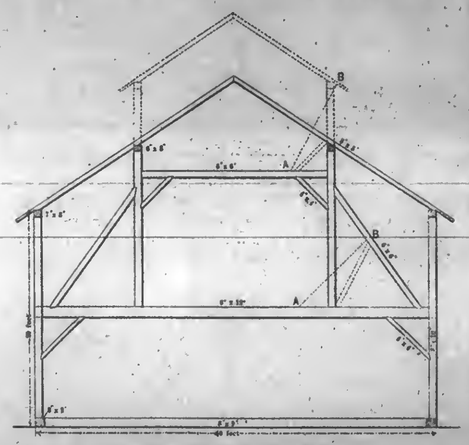

FIG. 1.—END OF A TIMBER BARN.

very rigid structure. The purlin post should be centered, tennoned, dovetailed and keyed into the beam, also drawbored. The beam should also have dovetailed tennons ke ed into the post with drawbores, the frame without guards or guards either 3 or 4 inches in from the base of the post, according as you use either 3 or 4 inch studs. These extend from the sill plate and are nailed or spiked to the guards. To support the floor timbers or joists spike a 2x4 piece on the sides of the beam and let the ends of joists rest on these. Mortise or dovetail one or two of the joists in each tier for ties, cover with good siding. If it is desired to use a hay-fork and the purlin beam is in the way we would suggest the plan of framing as indicated by the dotted lines. A B indicates a rod with no strain. A guard should then be framed into the purlin post, where the plate is now, for top end of lower tier of rafters. This plan gives an excellent method of ventilation, and, is better in both utility and appearance than the usual gambrel roof.

A A and B B show the lines of braces if such are deemed necessary. The barn is 40 feet wide over all. Sizes of timbers are shown on the sketch.

From "Amateur Decorator"—Will you kindly inform me as to the kind of "gum" or "shellac" that is used by plasterers for preventing suction in plaster work, and how is the material dissolved?

ANS.:—Use ordinary shellac which may be obtained from any druggist. The most suitable solvent for shellac is methylated spirit. Place 1½ lb. of orange shellac in a stone bottle with 1 gal. of methylated spirit and agitate at intervals until the shellac is thoroughly dissolved, after which the preparation is ready for use, and must be stored in an air-tight vessel; apply quickly with a fine-hair brush. The cheapest shellac is a deep orange color, and it will color your plaster. If this is an objection get white shellac, and dissolve and apply in the same way as for the orange.

From "Contractor"—I have just completed a home for myself, in the suburbs of the town I live in, and I want to finish up one little corner in my sitting room, with a lounge seat, reading desk and book case, making the whole into a sort of bachelor's cosy-corner. It must be made in one corner of the room in which there are no objections. Can you publish some sort of a design suitable to what I require; if so I will appreciate it very much?

ANS.:—In answer to this request we publish the illustration shown in Fig. 2, as being near about what is asked for, so far as we can understand it. It will be seen that this "nook" is formed by having a book-rack at one end, the side of the room forming the other end where a plain reading shelf forms the boundary. The reading shelf is placed near a window so that ample light is given. If there is no window in this position then the order of the scheme may be reversed to suit conditions. The back of the "nook" may be papered as shown, with a narrow moulding dividing the paper from the other part of the wall, or it may be upholstered, or even panelled, according to taste. The book-rack and reading shelf are simple affairs but may be elaborated if desired. A three-leafed screen may be placed in front of the opening if more seculsion is desired, and the little stand removed altogether. Properly managed this "nook" may be made quite attractive and add very much to the appearance of the room.

From "Ambitious Workman"—I am a young man have learned my trade as a carpenter, and have a general knowledge of brick and stone work, and of painting and plastering, but feel that this is not enough to enable me to become a successful building contractor, which I desire to be. What kind of education should a builder and contractor receive? In addition to a good knowledge of building construction, is a knowledge of estimating and taking out quantities an absolute necessity? Any information or "pointers" will be thankfully received.

ANS.:—Something more than a fair knowledge of building construction is required. A builder and contractor should know all about every material that is used in building, such, for example, as the place or origin, the best place to buy, the best method of using and the faults that have to be allowed for or provided against; and he should be continually on the lookout for new materials, or for new methods of using existing materials. He should also be conversant with all rules

of arithmetic, with algebra up to simple quadratic equations, and geometry, and be able to calculate many things mentally. Land surveying is desirable so that buildings may be set out with facility, and quantity surveying is an absolute necessity. These two subjects can either be acquired under a private tutor, or at any technical school like the one in Toronto. A practical knowledge of estimating is also absolutely necessary, but this can only be acquired by learning the actual cost of materials and the actual cost of the labor that is required in order to use these materials in a building. You should take a fair supply of building journals in order to keep in touch with current building events and improvements, and should stock your library with a good assortment of standard works on building matters, and above all keep a copy of the "Canadian Contractor's Hand-Book and Estimator" on your desk for daily reference. This work, along with Hodgson's "Estimating Brick and Frame Buildings," will give you an insight as to the proper methods of taking out quantities, and making estimates for all kinds of buildings. Experience alone, however, will be necessary in rounding off your fitness to become a successful contractor.

FIG. 2.—A COSEY READING NOOK.

From "Builder"—I have a segment to lay out, the chord of which is 28 feet, and the rise 3 feet; how can I get the curve without going to a great deal of trouble?

ANS.:—There is no royal way to solving questions of this kind; more or less knowledge of mathematics and geometry in particular is required in matters of this sort. However, here is a method that is about as simple and reliable as can be, and is employed, we believe, in ship building establishments for getting curves in many instances. Lay off the baseline AB, Fig. 3, for instance, 28 feet. At center, C, erect the perpendicular CD, representing the height or spring which, for example, in this case we make 3 feet. From G as center, with CD as radius, describe the arc DE, which divide into three equal parts. Also divide the space GE into three equal parts. Then draw lines cutting the points thus established, as shown in the sketch by 1 2 and 3 4. Divide each half of the baseline AB into three equal parts. Set the bevel to the angles 1 2 C and 3 4 C, and apply as shown at 5 6 C and 7 8 C. Repeat the same operation in the other half of the base. Draw lines 5 6 and 7 8, on which set off respectively the distances 1 2 and 3 4, as shown. Repeat this operation in the opposite half of the figure, then a thin piece of wood, sprung from A to B in such a manner as to touch the points just determined, will give the line of the arch.

From "Contractor"—I have taken a contract to build a stable in which the horses are to be stationed on the second floor, and I would like a little information regarding the concrete or cement floor which I have to put down under the horses feet. Will you kindly give me a few hints on the subject?

ANS.:—The floor, should, of course, be one slab of cement with the necessary gutters worked in to carry away the water. It should have iron ribs embedded in the correct position to give the greatest tensile strength to the slab, but being completely encased on every side by the concrete of the floors. The thickness of the floor and the weight and section of the iron ribs would be determined by the span, but the quantity, and therefore cost, of the iron would be very much less than the usual quantity and cost of the ordinary and bad system of heavy iron girders, which cut into pieces

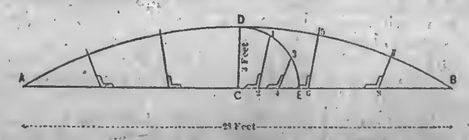

FIG. 3.—SHOWING HOW TO DIVIDE A LARGE SEGMENT OF A CIRCLE.

and reduce the strength of the concrete, and leave iron flanges exposed to the action of rust and fire. The concrete floor, with iron ribs, will be strongest, most fireproof, and dampproof, will have no lateral thrust to be counteracted, as in the case of brick arches and girders, and will also be cheaper. The surface can be finished with a coat of asphalte, paving bricks set in cement or smooth cement. We know of cement stable floors that have resisted the wear of heavy horses for over 15 years without repairs or injury. It is important that the work should be executed by persons thoroughly conversant with the method of construction, and experienced in the selection, treatment, and manipulation of the materials, particularly the cement.

TOWERS IN THE GROUNDS OF MONTREAL COLLEGE, SHERBROOKE STREET, PROBABLY THE OLDEST STRUCTURES IN MONTREAL, DATING BACK SOME 250 YEARS.

METHODS OF CONSTRUCTION IN RELATION TO INSURANCE.*

BY JOHN B. LAIDLAW.

The construction of buildings has ever been, and doubtless will ever be, a very important matter to the companies insuring property against loss by fire, and it affords me much pleasure to spend a few moments with the Architects' Association in discussing the standard of building construction adopted by the C.F.U.A. It is possible that in the past there has not been sufficient co-operation between those who supervise the construction of buildings and those who fix the insurance rate based upon the details of such construction, but whatever may have been the policy of the underwriters in the past, there is no question that to-day they stand ready to welcome any improvement in building construction and to assist that movement by means of discriminating rates as between buildings constructed according to their standard, and those in disregard of them.

The Underwriters have always recognized some of the essential features of good construction, such as that the walls of the building should be of brick or stone; that roofs should be of incombustible material—but they have only to a limited extent given attention to the interior construction, except as regards buildings to be used as manufactories. For the latter there has been for years a fairly strict standard, which while not requiring a building to be of what is now called mill construction, demanded strong bearing walls; limited the height and the area of the building; imposed serious extras in rate if there was a mansard roof; also required elevators to be in brick shafts outside a building, or be properly trapped at each floor; required stairways to be enclosed and have self-closing doors at each floor; also called for double floors and of sufficient thickness to carry the machinery in the building.

In accordance with this standard there was to be no inside sheathing of walls. The ceilings and joists were to be left open, and, speaking generally, an effort was made to avoid any concealed spaces in which dirt could accumulate, and fire not only originate, but be difficult to locate and extinguish.

The standard required the heating and the lighting to be as non-hazardous as possible; also the boilers for generating steam were to be in an outside separate building.

These were the general requirements, in addition to which there were other special requirements for each individual class of manufactory, such as requiring dry rooms in laundries to be of safe construction; shaving vaults and dry kilns in connection with woodworking risks to be outside the building; painting and varnishing and upholstering in furniture factories to be in a separate section, and so on throughout the different classes of manufacturing risks.

These requirements have had a marked effect during the last few years in alterations made to old factories and in the erection of new buildings. It is now intended to adopt a stricter standard for manufacturing risks in accordance with the most up to date requirements of what is called mill construction, the main difference between the new and the old being that under the new the floors are to be without joists and made of solid planking laid on edge, resting on wooden beams supported on strong wooden posts, with 10 foot bays, as a standard; this solid plank floor to be covered by a wearing floor of at least one inch in thickness. Such a floor interposes several inches of solid timber between the stories of a factory and leaves on the under side an almost absolutely smooth surface in which, or upon which a fire has difficulty to secure a lodgment. If these floors are left absolutely intact, a fire can, with comparative ease, be confined to the floor in which it originates, and such is the purpose of mill construction, but it is well to bear in mind that everything depends upon that "if"—if the floors are left absolutely intact. I have in mind a factory not 50 miles from Toronto of such construction, where the floor was cut to bring up a stairway. They might just about as well have saved their money and put in an ordinary floor for all the benefit gained.

Tonight however, it is proposed to ask your attention to the possibly more difficult subject of the construction of buildings intended for ordinary mercantile purposes in cities and towns.

When building a factory the first consideration is the business or purpose to which it is to be put. There is usually plenty of ground. The factory can be of any size, or height, or shape that the business requires, and the question of external appearance is but a minor one; when however one comes to consider the construction of a building for mercantile purposes in the heart of a city, say on King, or Yonge, or Queen streets in the centre of Toronto, there are a number of matters which cannot be overlooked, and it is well if any safeguards whatever against fire are introduced. The shape of the lot, the question of light, the business to be carried on, the question of access to the upper floors, must all be considered, and frequently the architect is forced to design a sort of general utility building when the tenant may not have been secured before the work commenced. These conditions have been recognized by the insurance companies and a standard has not been imposed which is too hard, but if anything rather lenient. It does not in any sense call for a fire-proof building, but rather for a well constructed building of joist construction with lath and plaster finish. In such however, there are many hazardous features which the architect can prevent being introduced, which if placed in the building will either induce a fire, or assist to spread it, and so must be charged for by the insurance companies. The standard reads as follows:—

CANADIAN FIRE UNDERWRITERS' ASSOCIATION.

MERCANTILE SCHEDULES.

BUILDING STANDARD.

A standard building is one having walls of brick or stone (brick preferred), not less than twelve inches thick at top storey (16 inches if stone), extending through and 36 inches above roof in parapet and coped, and increasing four inches in thickness for each storey below to the ground—the increased thickness of each storey to be utliized for beam ledges. Ground floor area not over 2,500 square feet (say 25 by 100); height not over three stories, or 40 feet; floors of 2 inch plank, (three inches better) covered by ⅞ or one-inch flooring, crossing diagonally, with waterproof paper or approved fire resisting material between (if tin or sheet iron between, see deductions); wooden beams, girders, and wooden storey posts or pillars twelve inches thick, or protected

* Paper read before the Toronto Chapter of the Ontario Association of Architects.

iron columns; elevators, stairways, etc., cut off by brick walls or by plaster on metallic studs and lathing; communications at each floor protected with approved tin-covered doors and fire-proof sills; windows and doors on exposed sides protected by approved tin-covered doors and shutters, or wired glass in metallic frame or a water curtain; walls of flues not less than eight inches in thickness to be lined with fire-brick, well burned clay or cast-iron, and throat capacity not less than 96 square inches if steam boilers are used; all floor timbers to be trimmed at least four inches from outside of flue; heated by hot water or steam; lighted by gas; cornices of incombustible materials; roof of slate, metal, or tile; if partitions are hollow or walls are furred off there must be fire-stops at each floor.

For differences from above the following charges and deductions are made to and from the Key Rate of a town which is determined by the Fire Protection Appliances provided:

WALLS.

INDEPENDENT—Charge for each 4 inches deficiency in average from standard (if building over 4 stories high, double the charge)...	.01
On buildings over 3 stories high if average thickness less than 12 inches, add not less than.....	.05

If two independent walls adjoin, 4 inches may be deducted from average of these requirements. Charge for one wall only—the most deficient.

A standard independent wall should be 12 inches the top story and increase 4 inches for each story to the bottom. This would require if 3 stories, an average of 16 inches; 4 stories, 18 inches; 5 stories, 20 inches; 6 stories, 22 inches; 7 stories, 24 inches.

PARTY—Charge for each inch deficiency in average from standard (if building over four stories high, double the charge).....	.01
If party wall less than 12 inches thick in any portion, add not less than.....	.05

A standard party wall should be 16 inches at the top storey, increasing 4 inches for each storey below. Average required for three storey building, 20 inches; 4 storey, 22 inches; 5 storey, 24 inches; 6 storey, 26 inches; 7 storey, 28 inches, etc.

PARAPET.

Walls not Parapet, each exposed side.....	.01
Parapet walls exceeding one foot above roof on all exposed sides, deduct for each foot in excess of one (not exceeding a total of .03).....	.01
Poor bricks or poor quality mortar.....	.10
Glass and wood or iron fronts, for each not backed up with bricks and mortar.....	.03
Glass and wood for each backed up.....	.01
" " for each adjoining in row, in addition to above.....	.01
HEIGHT—For fourth story, add.....	.05
Fifth story.....	.10
Sixth story.....	.25
For each story over six, add.....	.40

These charges cumulative; for example a six story building would have 40 cents added.

If any story double height, charge for two.

HEIGHT—Two story building, deduct.....	.02
One story building, deduct.....	.05

STREET.

If street on which building fronts is inaccessible, unpaved, etc., not less than.....	.10

(No charge if no fire department, and no charge for side or rear streets).

If less than 60 feet wide, but over 50.....	.01
If under 50 feet add for each 5 feet less	.01

STREET WIRES.

If to interfere with fire department.....01 to	.03

WOODEN CORNICES, CUPOLAS, Dormer Windows or Verandahs.....

Not less than.....	.01

CEILING OR SHEATHING.

Wood (natural or painted) or Strawboard Ceiling, 1 story, .03; each additional story charge.....	.02
Wood or strawboard siding, 1 story, .03; each additional story charge.....	.02

Double each charge if wood be varnished.

If side walls furred and plastered, half charge for wood sheathing.

Cloth or paper ceiling or siding on wooden studs, each story charge.....	.10
Metallic studs and lathing throughout, deduct	.05
Metallic lathing on wooden studs, deduct...	.02

FLOORS.

Tin or sheet-iron between floors, deduct.....	.02
Water-proof paper or cement between floors, deduct.....	.01
Floors water-proof and also inclined with scuppers to carry off surplus water to sewer, deduct.....	.02
If floors exceed two inches in thickness, deduct .01 for each excess inch (in addition to above).....	.01
If grade floor fire-proof.....	.10
Each fire-proof floor above grade (not exceeding a total of 25c.).....	.05
No cellar or basement, deduct.....	.05

AREA (GROUND FLOOR).

2,500 to 5,000, sq. ft. charge for each 1,000 in excess of 2,500 sq. ft.....	.01
5,000 to 10,000, sq. ft. 3 stories, 1,000 in excess of 2,500 sq. ft.....	.02
5,000 to 10,000, sq. ft., over 3 stories, 1,000 in excess of 2,500 sq. ft.....	.03
10,000 sq. ft. or more, 3 stories, 1,000 in excess of 2,500 sq. ft.....	.02½
10,000 sq. feet or more, over 3 stories, not over 6, in excess of 2,500 sq. ft.....	.04

(Not exceeding a total of 200 cents).

10,000 sq. ft. and over 6 stories, double the area charge.

(Not exceeding a total of 300 cents).

If building is of standard fire resisting construction throughout, halve the area charge.

On-estory building, one-half the charge for 3 story.

Two-story building, two-thirds the charge for 3 story.

If curtain, cross or division walls, sub-dividing and strengthening the building, even though with arched openings, deduct 10% of area charge for each wall so dividing the risk, not exceeding a total deduction of 40% of the area charge. Communications with adjoining buildings unprotected, charge for area both buildings, and rate as one (allowing for division wall). If fire-doors on communications are not standard, rate as if standard and make an additional charge under "Exposures" for defective doors.

Single Occupancy—If only one tenant outside of dwelling and office tenants twenty per cent. (20%) of the area charge may be deducted.

Small Risks under 1,500 sq. ft. ground floor area and not over 3 stories high, deduct.	.05
FRAME REARS—Extensions for each 100 feet wall area, (not more in all than 15c.) charge..	.01

If brick veneered, metal clad, or with openings protected with approved metal covering half charge.

STAIRWAYS.

Enclosed in lath and plaster hallway or provided with automatic trap-doors in floors.	.03
Similiar to above with traps closed only at night.....	.05
Fire-proof enclosure, but defective doors, etc.	.02
Enclosed in wood.....	.07
Enclosed in wood with self-closing doors each floor.....	.05
Open.....	.10

If more than one stairway, charge for worst and add one fourth charge for each additional.

One half charge for stairway if charge for elevator—halve the smaller charge.

If elevator and stairway are contained in the same shaft or opening, only one charge for the two.

No charge for stairways in buildings occupied exclusively for offices and dwellings above first story when stairway does not open into store.

ELEVATORS.

Enclosed in lath and plaster shaft or hallway, or if provided with approved automatic trap doors at floors..... .05
Fire-proof shaft, but defective doors, or walls not through roof..... .03
Open..... .10
Wooden shaft without approved automatic traps..... .15

One-half above charges for elevators in buildings otherwise standard, or in office building.

If more than one elevator, charge for worst and add one-fourth charge for each additional.

WELL HOLES.

If open, add for each (half charge for approved traps) from..... .03 .05

CHUTES, VENTS AND DUMB WAITERS.

(Unless fire-proof shaft), and small floor openings—Add for each, (if trapped half charge)..... .01

SKYLIGHTS.

If of thin glass (less than ¼ inch), in any kind of frame, charge for first 25 feet of total area .02, and for each additional 25 feet of area .0½. If more than one small sky-light charge for each (not more in all than 25c.)..... .02

If skylight is monitor style, charge for square feet in sides as well as top.

If ¼ inch glass in wooden frames, half charge.

If ¼ inch glass in metal or protected frames, one-fourth charge.

If protected above and below by wire netting, halve the charge.

If wired glass in metal or protected frames, free.

Same charges for floor-lights less than ¾ inch thick.

IRON COLUMNS UNPROTECTED.

Cast Iron .03; steel or wrought..... .05

LIGHTING.

Electricity, approved..... .02

Any other system for lighting must be subject to approval of Local Board of Underwriters and charged for by rule.

Kerosene (no charge if charged for electricity), not less than..... .02
Kerosene lighting in hazardous risks, such as paint shops or carpenter shops, not less than..... .10

HEATING.

If by hot air furnace, not less than..... .03
Furnace with metallic cold air box, and all vertical hot air pipes, through brick walls and one register fastened open, add..... .02
Stove (for each additional stove .01). (Must have metal under)..... .02
Stove in wood working establishments... .05 .25
Natural gas or oil fuel, approved pressure regulating appliances..... .05

CHIMNEYS.

Not built from ground, but on brackets, charge for each..... .05
If inadequate for service required, or walls of flues less than 8 inches thick, unless lined with pipe, not less than..... .05
If resting on attic floor beams or roof joists, add..... .25
Poor bricks or mortar..... .20
Terra-cotta or cement..... .50

STEAM BOILERS.

(Other than heating). Charge if in basement .05; above basement .10; wood shavings for fuel 1.00 additional.....

If boiler in fire-proof room cut off in approved manner, no charge.

POWER.

Charge according to hazard.....

ROOF.

Composition and gravel, if not well covered. .02
Shingles (if laid in mortar 5c.)..... .10
Mansard with wooden frame, 4 story or lower building, for each lineal five feet, but not more than 10c. for one side or 15c. in all..... .01
Mansard on building 5 stories or more in height, ¼c. additional for each lineal five feet, for each story over four.....

BLIND ATTIC, ROOF SPACE, COCK LOFT.

Take maximum height if slanting roof, and charge for each vertical foot .01, not less than .03 or more than..... .05

AGE OF BUILDING.

Over twenty years charge..... .02

OCCUPANCY. .....

.....

.....

.....

Each ordinary mercantile occupancy in excess of one, exclusive of office and dwelling tenants, charge..... .02
Each hazardous mercantile occupancy, charge .03
Each light manufacturing occupancy, not less than..... .05
Occupancy exclusively dwelling above grade floor, if one family, deduct..... .10
(If only one floor so occupied, deduct .05)
Occupancy exclusively dwelling above grade floor if two families, deduct..... .05
Occupancy if more than two families, deduct Nil.
" if tenement house above grade floor, deduct..... Nil.
Occupancy if building occupied throughout exclusively for offices or dwelling and offices..... .15
Occupancy if occupied exclusively above grade floor for offices, or offices and dwelling..... .05

PROTECTION.

Charge if not within 300 feet of hydrant on 4 in. main circulating or 6 in. main dead end..... .05
Iron fire escapes outside of building, with landings at each floor, deduct..... .02
Casks of water or filled pails on each floor (6 filled pails to each 2,500 square feet of floor area), deduct..... .05
(One-half number may be filled with sand. One cask may be considered the equivalent of three pails.)
Standpipe, internal with tank supply, deduct .02
" " without tank supply, deduct..... .01
Standpipe, external, with siamese connection for use of fire department, deduct... .01
Each side or rear accessible to fire department (no deduction for front), deduct... .02
Fire department house, engine, hose or hook and ladder, within 300 feet .01; if next door or on opposite side of street deduct .02
Basement and sub-cellar perforated pipe sprinklers, deduct..... .02
Automatic sprinklers in basement, (no deduction if allowance has been made for sprinklers throughout building)..... .05
Roof hydrants if protected from freezing... .02
Floor beams and girders self-releasing.... .01

Auxiliary private fire plant, force pump, etc. .05
Watchman, with portable clock..... .05
" with electric detector..... .10

EXPOSURES. To be charged by inspectors according to circumstances.

CONFLAGRATION HAZARD. Charge for such when conditions require.

ADD FOR FAULTS OF MANAGEMENT, EASILY CORRECTED.

140 If stovepipes through floors or partition, not protected, .50; through window, roof or wall, with double metal chimney, .50; not protected, 1.00; entering bottom of flue vertically, .25; entering flue in attic or unused room, etc..... .25
140a Floor beneath stove not protected.... .05
141 Bottom of elevator shaft used for closets, etc., or waste..... .50
142 Swinging gas brackets or bracket lamps unprotected, for one .05. each additional one..... .01
143 Untidiness, rubbish, ashes, etc., especially in cellar or attic, .25; packing material not in bins..... .15
144 Cracked or bulged walls, thin and worn floors, broken plastering, broken windows, etc.....10 to .25
145 Empty boxes, rubbish, etc., in rear yard, alleys, window recesses, under sidewalk, gratings, etc..... .10
146 Open lights in show windows or electric bulbs covered with tissue paper or paper shades..... .25
147 Sawdust on floors, sawdust spitoons, etc. .25
148 Kerosene used to sprinkle floors..... .25
149 Ash and waste cans, not metal..... .10
150 Furnace top within 4 inches of wooden beams or ceilings, if brick; or within 12 inches if portable, with metallic shield .10 to .25
151 Fire-places, hearths on wooden beams, or floors within 16 inches of fire-place; or wooden fire-boards, or summer pieces, or unprotected wooden mantels, or open stovepipe holes.....05 to .25
152 Steampipes in contact with wood, not less than..... .01
153 Elevator or other shafts communicating with roof space..... .25
154 Electric lighting or other system, with installation not in compliance with underwriters' rules; or arc lights unprotected by tight globes or metal screens..... .25
154a Crowded merchandise without proper aisles, opposite or too near windows, overloading, not less than..... .25

Now if you will allow me I will take up each feature in detail.

First—the walls. It is necessay to have a solid wall, not only to sustain whatever weight the building may, during changes of occupancy, be called upon to bear, but also to stand firm and keep out a fire which may burn the neighboring premises. We therefore ask that the side walls shall rise above the roof three feet, as a parapet over which the flames will have difficulty in leaping. We sometimes find that a wall is carried up three feet above the roof but the cornice is run continuously along the front from one building to another. The cornice should be cut as well as the roof.

We call for increasing thickness of walls as the building increases in height, and that the ledges formed by the increase in thickness shall bear the floor joists. This is very important as we are constantly finding that the practice of inserting joists in the walls by leaving out a couple of bricks, not only conveys fire through the walls should the adjoining building burn, but also when a serious fire occurs in the supposed building under consideration, the falling of the floors brings the walls down, causing a total loss to it and to its contents, and also lets the fire through into the next building.

Party walls require to be four inches thicker than independent walls, the reason for which I am sure will be apparent to every architect. There are many party walls erected in which the joists have only four inches of brick between their ends, and in some cases the joists actually meet and overlap. Such walls are hardly worthy of the name.

The schedule imposes an extra charge on the building if a large amount of the front is of glass or wood, and the charges for exposure to a building so constructed, are also increased.

Our standard calls for a building of moderate height; if that height is increased, extra charges are imposed.

There is a small charge for wooden cornices on building, but such increase the charge for exposure from the adjacent buildings and should be avoided as much possible.

The standard ceiling is plaster upon wooden lath, or a ceiling of metal. There is of course no objection if an old ceiling of plaster upon lath, is covered with metal.

Wood for sheathing of walls or ceilings is decidedly objected to, and still more so if the wood be varnished, the charges in that case being doubled. With wood at its present price there is no economy in using such inflammable material for partitions or ceilings, and the insurance companies hope that such will soon be a thing of the past. If metallic lath is used throughout the building instead of the ordinary wooden laths, a reduction is allowed.

The standard calls for floors to be three inches in in thickness. If they are thicker than that, an increased deduction is allowed for each inch in excess. It is recognized that there are very few floors that exceed two inches in thickness, and so in applying the charges, there is a deduction allowed for every inch in excess of two inches.

Then again, if the floors are double and if they have metal between, or if the floors are made water-proof, and drained to carry off any water thrown upon them, or if the floors are made fire-proof, that is, of steel and concrete construction, with the steel properly protected by metal lath and plaster, or porous tile, deductions are allowed.

If the area exceeds the standard, there are extra charges, but even in this case if there are numerous brick walls sub-dividing the building, the area charge is reduced. It is very difficult to locate a fire which may originate in a building of large area, as the smoke at once fills the whole building and when the firemen arrive they waste a large amount of precious time in endeavoring to get at the exact spot where the stock or building is burning.

When the Murray store burned, the building was filled with smoke and the firemen could not see what they were doing; they found after they had been working for two hours that they were throwing the water against a brick wall, the fire being on the other side of it. This does not happen in a small store, or one which is divided into sections.

Now let us suppose that a building has been constructed with solid walls, with double floors, that metallic lathing has been used throughout the building, and what has been gained if numerous openings from floor are introduced?

I would like to draw your attention to Robert Simpson's building on the corner of Queen and Yonge streets, one of the best examples of fire proof construction in the city. In it there is an immense light well from cellar to roof. There are also openings from floor to floor for stairways and elevators. A fire starting in that building would have every opportunity to spread from cellar to roof in an incredibly short time, and if such did happen it would be found that the fire-proof building was nothing more than an immense stove in which the contents would be speedily and completely consumed, although the building itself might remain comparatively unhurt. Were it not for the introduction of automatic sprinklers such a risk would probably not be insured for less than 5% per annum,

and even at that rate the insurance secured would in all probability be but a fraction of the value.

The insurance companies recognize the difficulty of providing an absolute cut-off between floors in a mercantile building, but such is possible, either by having a fire-proof elevator and stairway annex cut off from each floor by fire-proof revolving doors, or if the elevators and stairways must be in the building, then in a shaft walled in by metallic lath and plaster, and (or) wired glass. Well holes or light wells can also be closed by wired glass either perpendicularly around the shaft, or horizontally at the floor line, or better still, construct the building so as not to require such at all. If elevators and stairways are introduced, the companies must charge for them, the charges being so fixed that even if the owner cannot entirely remove the hazard, that the companies will make some allowance for a partial protection.

In this connection let me give you an illustration. If a property owner were to erect six stores alongside of one another, each, one story high, with a brick wall in rear and in front and at each end, but with only lath and plaster partitions between each store, everyone passing would say; that is a shell; that is no better than a frame building; that is a fire trap. But if we can imagine the supposed property owner turning the supposed block of stores upon end so that the first store to the left is the first storey of the new building which is six stories high, and if the supposed property owner immediately starts to make openings between each of the lath and plaster partitions, inserting stairways from floor to floor, and also introducing an elevator from cellar to garret, the passer-by looks and says, that is a splendid building.

We require that skylights be of wired glass in metal frame, and where so built there is no charge. A skylight of thin glass in wooden frame is a conflagration breeder. It not only assists a fire inside but invites the outsider to come in.

Heating by hot air furnaces and by stoves has cost the companies a tidy sum and such is charged for.

Chimneys should not be placed on brackets. Such is a dangerous expedient; if it must be resorted to, a charge must be imposed.

The mansard roof is an undesirable style which is rapidly disappearing. Where such is constructed it necessarily means that a large amount of wooden material is placed in the most dangerous position in the building—hardest to reach should a fire occur, and the point to which all flames naturally go whenever a fire breaks out. Such a roof either entails the destruction of the building or a very serious loss, owing to the amount of water required to extinguish a fire in it.

Many buildings are constructed with blind attics. Such should be avoided wherever possible; particularly should great care be taken that there is no opening from an elevator shaft into a blind attic. Such condition is frequently found and is exceedingly careless and dangerous.

A good many buildings are still roofed with shingles. It is hoped that the architects of Toronto will use their influence to discontinue the use of this most dangerous roof covering. Numerous conflagrations can be traced to the fact that the buildings had shingle roofs. Such not only burn rapidly themselves, but set fire to others, and after a fire has been burning a short time, the shingles will rise from the roof and fly like birds to a considerable distance.

If internal protection against fire is provided, there is an allowance made, particularly for casks and pails, which any workman or even child, knows how to use, but the companies place their chief reliance on the speedy arrival of the fire brigade, and also that the construction of the building is such that the fire will not have been able to gain undue headway before the brigade arrives. If the building is constructed with open elevators, open stairways, or open well holes, a fire will spread with great rapidity from cellar to roof, and by the time the brigade will have reached the scene, the flames will probably be breaking out of every window and cannot be stopped by any brigade short of almost a total loss. If the elevator had been trapped, the stairway or well hole closed, the fire would probably be still burning upon the floor in which it originated, and the firemen would have a fair chance to extinguish it.

It may be of interest to the architects to know that the Mercantile Schedule which we are to discuss this evening, is based on a schedule compiled a few years ago by a large committee composed of the leading underwriters in the Eastern States, who after more than two years of conference and committee work, published the Universal Mercantile Schedule. I have a copy of this schedule here and can procure others if your members desire to have them for reference.

This work is the basis of the schedule we have adopted in Canada. It will I think repay any time an architect may devote to its study, and I take the liberty of commending it to you to-night.

I may also point out that the schedule referred to has not as yet been put in force in Toronto, and may not be for a few months or even a year. Anyone however, who is about to build would be wise to comply with the requirements of the standard.

The schedule recognizes that a building may be well constructed and still be used in a careless and dangerous manner, and so there are charges for "Faults of Management," such as unprotected stove pipes through floors or partitions—unprotected floors under stoves—bottom of elevator shaft used as a waste dump—swinging gas brackets—badly placed heating furnaces, and dangerous fire places.

The last charge for crowding and overloading the building will, I am sure, appeal to all here as a direct incentive to tear down and build greater.

I am afraid you are all weary of this subject, which I regret I am not able to make as interesting as a critical dissertation on the colonial style or some other one equally fashionable, but I am nearly through now and merely wish to direct your attention to some features of our charges for exposures.

A study of conflagrations in cities shows that they are generally caused by unprotected openings in adjacent walls, a fire being enabled by such to spread quickly to several adjacent buildings and soon provide the brigade with a job quite too large for their fire-fighting equipment. Care should therefore be taken by the architect to guard against this danger, and when there must be numerous window openings in a wall facing another similiar wall a few feet distant, that such are protected by outside shutters of wood covered on both sides with metal, or have a metallic frame and wired glass in each exposed window, or provide a water curtain. Also if possible, avoid having the windows in one wall directly opposite the windows of the other. This can often be easily arranged.

Do not cut off a one storey section by a solid wall on the ground floor and leave several windows in the higher building looking down upon the roof of the lower one. Avoid heavy wooden cornices, and if there must be an overhanging eave, see that it is covered with metal. In Montreal a very popular form of roof is centre drained, such not requiring any projecting eave. Also avoid breaking division walls between buildings. It is astonishing to what an extent this practice has grown, until we sometimes find that in as many as ten adjoining buildings there is not one party wall absolutely intact.

If party or division walls must be cut, then be careful to leave no wood about the opening, which should be arched and provided with a sill of stone or concrete, while the door to close the opening should be really and truly standard—such, properly hung on an incline are less in the way, and less unsightly than the old hinged door.

The insurance companies in adopting this standard, hope that it will induce more careful planning, more solid construction, fewer fires, and lower rates. The standard should be of service to the up-to-date architect and we hope it will be freely used by you all in persuading the property owner that good construction and good returns go hand in hand.

THE NOVA SCOTIA FREESTONES.

The changing fashions in stone used for building purposes in all the large cities of America have called out many comments, not alone from practical stone men, but also from general writers who are impressed by the varying effects of city architecture. The brownstone fronts of New York, which formerly lined street after street, with their stately, if sombre facades, figure in every description of the city. As the brownstone yielded place to other materials, every visitor to the city felt called upon to record the change. About a generation ago one stone, although in several colors, was largely used in New York and in all of the leading eastern cities. It has everything to commend it; beauty of color, fineness of texture, ease of working and durability. But its reign was comparatively brief. After a few years of high favor, it passed almost wholly out of the market and now scarcely a foot of it is used in New York and but very little in any of the American cities. Perhaps one reason for this is that it was not an American stone and that our architects and builders thought that they should give the preference to a native product. This was the Nova Scotia freestone. The buildings in which it was used that are still standing afford striking testimony of its excellent quality. About 1865 Mr. Charles D. Archibald furnished the Nova Scotia sandstone in what is known as the olive color for the wall around Central Park. This stone came from the Mary's Point quarry in New Brunswick. Stone in a wall like this in such an exposed position does not have the protection from the weather that is afforded by a building, but this has lasted admirably and few freestones would have endured as well.

About three or four years later one of the first building jobs in the Nova Scotia stone was the Dry Dock Savings Bank on Fourth Avenue, which is still standing. This stone was furnished by the late G. P. Sherwood from the "Budro" quarry on the Petit-Codiac river in New Brunswick. Mr. Sherwood also furnished the stone for the old Hanover bank building, on the corner of Pine and Nassau streets, recently torn down to make room for the new twenty-two story structure of pink Milford granite. When the old building was destroyed it was seen that the stone had weathered perfectly, that every arris was as sharp as when originally cut and that the carved work still bore the mark of the chisel. Many other important buildings were erected of this stone, among them being the block at the corner of Forty-fifth street and Sixth avenue, from the Sherwood quarries, and the Sloane building on Broadway, of brownstone from Mary's Point.

In the New England cities the Nova Scotia freestone was held in still higher favor and its general use by the architects and builders continued for an even longer time. Among the notable structures in Boston which made use of either the russet or olive stone were the Fifty Associates building on New Washington street, the Harvard buildings on Arch street, the Boylston Bank building, the Young Men's Christian Union on Boylston street, the Columbus Hotel, Parker Memorial Hotel, Hotel Commonwealth, Dr. Lothrop's church, Providence and Lowell depots, the Catholic Cathedral on Washington street, and Prof. Agassiz's Museum, besides many imposing blocks of dwellings and business houses.

Although there has ceased to be any considerable market for this stone in the States, it is in good demand throughout Canada. There is every reason for this aside from mere local pride. Some of the quarries have been worked for a great many years, but the amount of high-grade stone that is still available is unlimited. In a few places quarrying is conducted at a disadvantage. On the River John and the River Philip, most of the quarries are below the river level. The method of working them is to build a dyke or dam along the shore, pump out the water within and then open a quarry. The objection to this method is that it is impossible to keep the water out at all times and it is well known that salt water has a very deleterious effect on sandstone. It frequently causes it to scale or chip and at the best it almost certainly leads to efflorescence. So general is this fact recognized that when the stone used to be shipped to the States on barges the dealers insisted upon its being stowed in the hold and would not purchase it if it made the sea voyage on the decks. At Wallace Harbor the quarries are admirable, having level beds capable of furnishing fine platforms. The stone is overlaid with from 12 to 20 feet of stiff clay. This is a peculiar formation and has almost a leathery toughness. It has to be removed with a pick. At Kennetcook is found a dark brown and an olive and a blue grit, the latter of which is used for grindstones. A cargo of this grit was sent a number of years ago to the water shops at Manchester and other place in Great Britain, and the workmen declared it made the finest grindstones they had ever used. For some reason no great industry was ever built up at this place. Manuidie was also another place that was famous for its grindstones and scythe stones. These deposits were worked for many years by the Seaman Brothers, whose name was known throughout the world.—Stone.

THE BUILDERS' FOREMAN AND CLERK OF WORKS.

At a recent annual dinner of the Provident Institution of Builders' Foremen and Clerks of Works of Great Britain, the chairman, Mr. F. Higgs, thus described the qualifications of a successful builders' foreman and clerk of works—"Every good foreman should be careful, accurate and shrewd, and should have patience, forbearance and tact, personal magnetism, organizing power, fidelity to duty—in fact, character. The Clerk of Works should be honest in purpose and action, disinterested, fair and unbiased in judgment, open-minded for new methods and ideas, not wanting in a due sense of proportion and able to see two sides to a question. The ideal foreman and clerk of works did not quarrel, but pulled together, for though there might be two ways of looking at a work, it must not be forgotten that there was only that one work."

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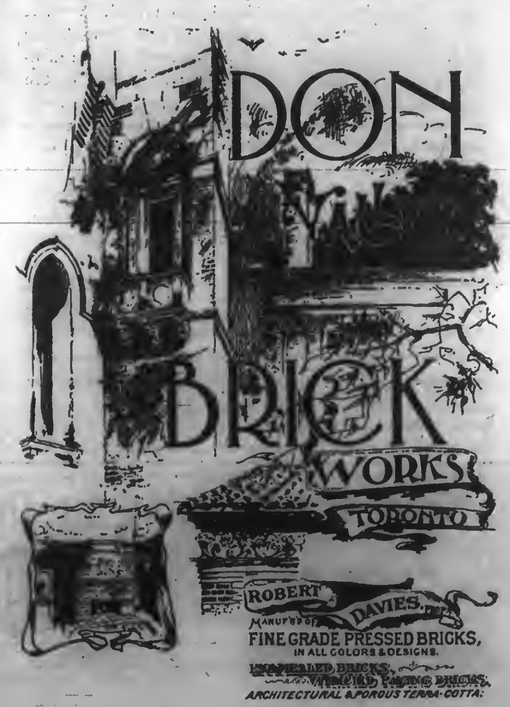
NOTES.

It is stated that during one month recently, nearly 100,000 tons of iron and steel material were imported through the three ports of New York, Philadelphia and Baltimore. The shipment included pig iron, steel billets, steel and iron rails, structural steel and wire rods, and plate bars. The immediate demand for such products is so great that the domestic plants, extensive as they are, cannot meet it.



MEN WHO BUILD A SKY-SCRAPER.

According to the Architects' and Builders' Journal the following staff is employed in the erection of a modern sky scraper :—

Laborers	300
Carpenters	100
Concrete layers	30
Riggers and riveters	150
Stone-masons	15
Tile layers	30
Electricians	30
Plumbers	20
Bricklayers	20
Plasterers	50
Marble workers	20
Housesmiths	25
Painters	25
Steam-fitters	25
Roofers	30
Sheet-metal workers	20
Elevator workers	30
Boiler and engine erectors	30
Mail-chute workers	10
Stationary engineers and firemen	10
Total	970

PERSONAL.

A partnership has recently been formed between Messrs. G. W. Grant and A. E. Henderson, architects, of Vancouver, B. C.

Mr. L. Feystore, builder, and a resident of Toronto for thirty years, died in that city recently following an operation for appendicitis.

Mr. Silas E. Hoidge, a well-known and highly respected builder of Toronto, died in that city last month as the result of a fall from a building on which he was working at Toronto Junction.

Acknowledgement should have been made in our March issue to the publishers of La Presse, Montreal, to whose courtesy we are indebted for the use of the plate from which was printed the illustration of the Polytechnic School.

The Building Contractors' Council, of Chicago, have determined to sign no agreements with Unions that do not contain a clause prohibiting sympathetic strikes, limitation of amount of work a workman may perform in a day, or that do not permit the unlimited use of machinery, the employment of apprentices, and the right to employ or discharge any workman at pleasure.

The most artistic and durable color effects on shingles are produced with Shingletint, which is a scientific combination of linseed oil, coloring matter, creosote, and the necessary drying agents.

Among the many shingles stains offered Shingletint is conspicuous not only for its superiority but because it can be called for by its distinctive name, thus offering the consumer protection against inferior goods offered for the same purpose.

When buying Shingle Stains it will be worth while to ignore the "just as good" argument and insist upon Shingletint.

Stained woods and descriptive literature sent free upon request.

Berry Brothers, Limited

Varnish Manufacturers,
New York Philadelphia Chicago St. Louis
Boston Baltimore Cincinnati San Francisco
Factory and Main Office, DETROIT

The Canadian Bridge Co., Limited

Walkerville, Ontario.

MANUFACTURERS OF

STEEL BUILDINGS, ROOF TRUSSES

Railway and Highway Bridges and Structural Steel and Iron Work of all descriptions

Estimates furnished upon application.

TERRA COTTA FIREPROOF BUILDING MATERIAL

POROUS TERRA COTTA among underwriters is classed as preferred risk, and the schedule of rates now enforced in the city of New York shows a difference, often great, which, computed means an annuity on large sums of money.

This indisputable fact appeals to architects as representing clients who may soon be exposed to the same classification in Canada. An apparent saving in selecting cheaper fireproof material may be more than lost through increased insurance cost.

POROUS TERRA COTTA FIREPROOFING is a credit to the buildings in which it is used and increases their selling value.

The **Montreal Terra Cotta Lumber Company,** Limited,

N. T. Gagnon, Selling Agent, 204 St. James St., Montreal, Canada.

ADVERTISING VALUE.

It is very well for some men to say they believe in advertising, and to expect a liberal return from their investment merely as a reward for their faith in the value of publicity. It is quite another thing to get value out of the space used. The belief in advertising is natural since advertising has done much for many establishments and individuals, but it will not do much unless much is put into the advertising. The real secret about business is business, and the real worth of advertising depends on business also. It is necessary to put common or uncommon business judgment into the space used for the benefit of the business and to make the establishment, the goods and the methods stand out before the possible customer in a light which will be pleasing and help the public in general to understand the worth of the stock. There are those who talk ethical advertising and ideal publicity to an extent that they really believe in it themselves, but will be disappointed in results unless they get something into that advertising which will give it vitality. It is useless to expect to impress a public with the standing of a firm as an up-to-date business combination unless there be life in the advertisement. The message must show the strength of the merchant behind it and must demonstrate the merits of the place. The point is the life and character of the announcement. Make it stand out in every line and make it so conspicuous that any possible buyer will see it and appreciate it.—Advertising World.

NOTES.

At Upleatham, North Yorkshire, is said to be the smallest church in England. Its size is 17′ 9″ x 13′. The building which is 900 years old, is now used as a cemetery chapel.

An International exhibition of building materials and methods has been arranged for at Paris this year. The date of opening has not yet been announced. Great Britain, Germany and Belgium will be well represented. A leading feature of the British and Belgian exhibits will be plans for low cost dwellings.

Upwards of twenty committees and subcommittees composed of persons prominently identified with the iron and steel industries of Great Britain have been engaged for a considerable time on the work of standardizing structural iron and steel sections, equal, unequal, and bulb angles, bulb tees and plates, H beams, Z and T bars, channels and beams. Thirty sections of H beams are given, varying from 3in. by 1½in. to 24in. by 7½in., and weighing respectively from 4 lbs. to 100 lbs. per ft. The Engineering Standards Committee states that beams ordered to the standard thickness shall be practically accurate in profile; but if the thickness of the web is less or greater than these standards, the width of the section will be decreased or increased by the same amount; and it is suggested that beams be ordered by depth of section, width of flanges, and weight per foot. It is claimed that the standardization of sections will effect a saving of several million pounds annually.

William Clendenning writes in "Fireproof" on the subject of "Misplaced Fire Escapes." He states that hundreds of fire escapes in our principal cities follow window lines vertically, from top to bottom, thus exposing them directly to the action of fire when it bursts from the windows at each floor, rendering the escapes unsafe and unfit for the exit of any human being, because they become red-hot in many cases, thus making them death-traps rather than fire escapes. In the course of a single street car ride in Chicago the author says he counted on one side of the street sixty-five fire escapes so located as to be utterly useless in cases of fire on either side of the lower stories. The remedy for this alarming state of affairs is to place the fire escapes at or near a corner, or at least removed from immediate proximity to windows, with platforms communicating at each floor, and so give the tenant a chance for his life. This subject is probably new to most people and should be looked into by building inspectors. A fire escape placed in front of a row of windows should be condemned and the owner required to remove it to a comparatively safe position.

John Mackay & Coy., of The Canadian Bank of Commerce Building, Toronto, would like to be placed in communication with a firm of architects of the highest professional standing, and of special experience in the erection of modern Bakeries. Communications will be held in the strictest confidence.

LIGHT

The "Best" Light

Brighter than Electricity or Acetylene and Cheaper than Kerosene

Makes and burns its own gas. It is portable. Requires no pipes, wires or gas machine. A safe, pure white, powerful steady light. 500 candle power costs 2 cents for fifteen hours. Permitted by Fire Insurance Underwriters. No wicks to trim, no smoke or smell. Saving effected by its use quickly pays for it. Over 100 styles for indoor and outdoor use. This is the Pioneer Incandescent Vapor Gas Lamp. It is perfect. Beware of imitations. Agents wanted everywhere. Every lamp warranted. THE BEST LIGHT CO., 225 East Fifth Street, Canton, Ohio.

LIGHT

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The Sun Portland Cement Company, Limited, Owen Sound

MANUFACTURERS OF

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Suitable For All Purposes

ASK US FOR QUOTATIONS JAS. A. CLINE, Managing Director

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THE PERFECT BUILDING STONE

Manufactured by the most modern process from select building stone.

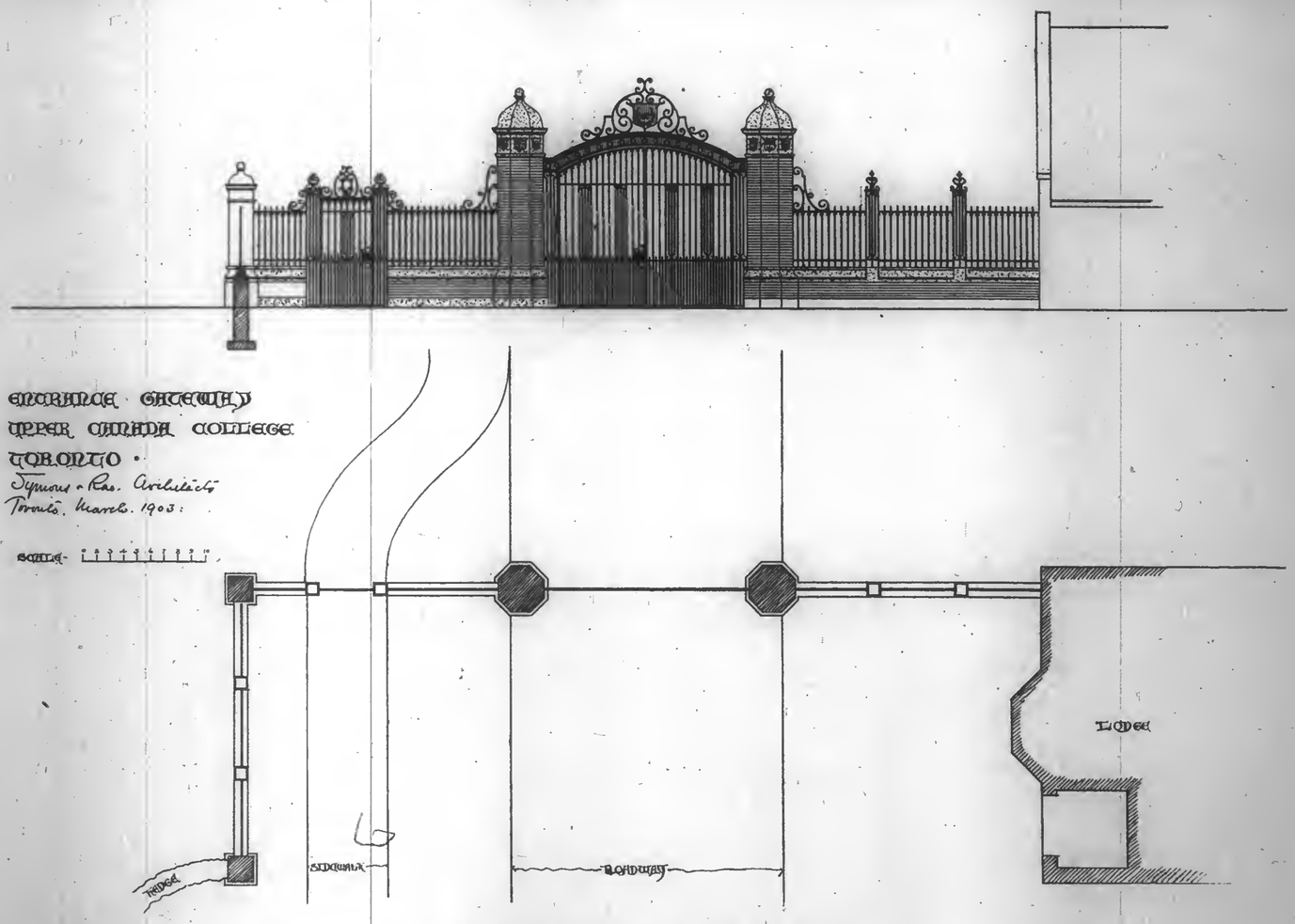
Cheaper than natural Stone.
Absolutely fire proof material.
No limit to its possibilities of application.

STRENGTH AND BEAUTY

Has the exact appearance of natural Stone and is stronger and more durable.
Made in any color or texture for exterior or interior finish.

Contracts executed for anything in Stone or Concrete
Correspondence and Inspection of our plant solicited.

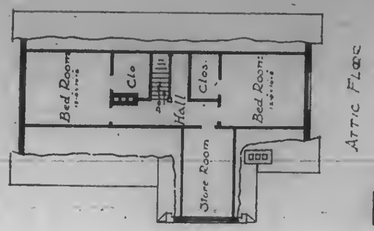
THE ROMAN STONE CO., LIMITED, MARLBOROUGH AVE., TORONTO.



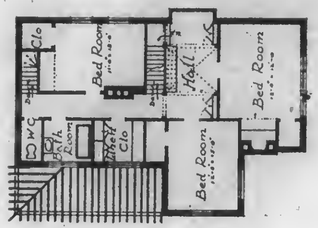
ENTRANCE GATEWAY, UPPER CANADA COLLEGE, TORONTO.

SYMONS & RAE, ARCHITECTS.

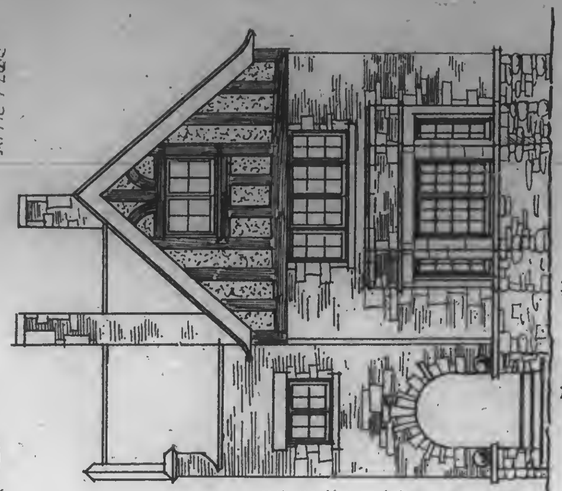
SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
APRIL, 1903



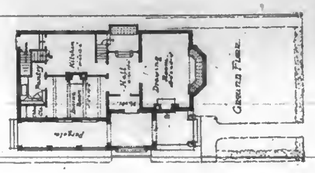
ATTIC FLOOR.

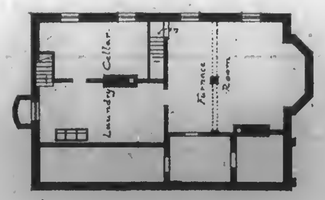


FIRST FLOOR.

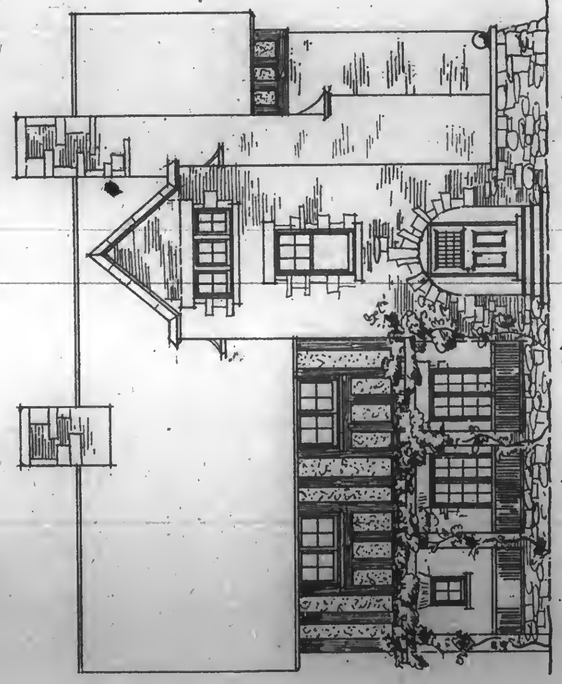


EAST ELEVATION





BASEMENT PLAN.



SOUTH ELEVATION

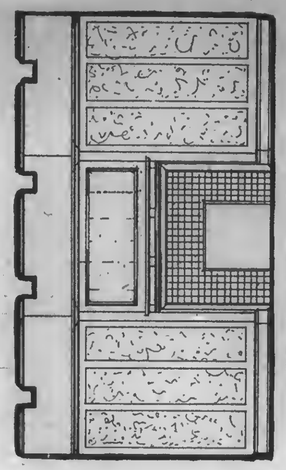
SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
APRIL, 1903

"C. A. & B." COMPETITION [illegible]WN OR SUBURBAN HOUSE.

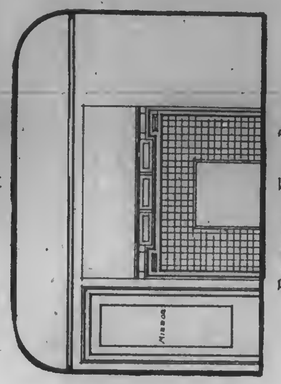
DESIGN SUBMITTED BY "T SQUARE, JR." [illegible] (HARTFORD), AWARDED HONORABLE MENTION.

CANADIAN ARCHITECT AND BUILDER.

DESIGN FOR A SUBURBAN RESIDENCE BY T-SQUARE JR.
JAN. 1903.
Scale 1 Inch = 2 Feet.

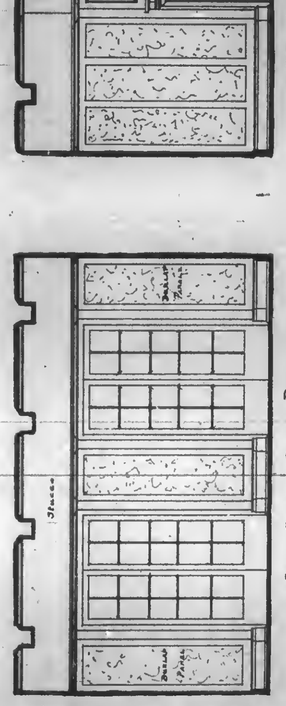


NORTH SIDE OF DINING ROOM



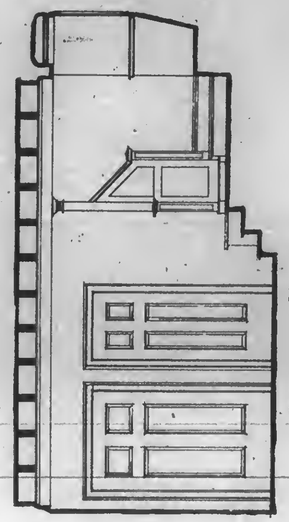
FIREPLACE FRONT BEDROOM.

Note: it might be as well to have one fireplace in room of this description as could then be used for flue.

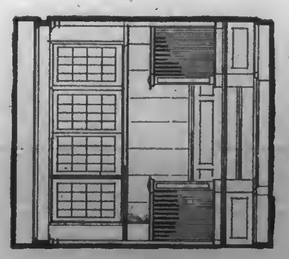


SOUTH SIDE OF DINING ROOM.

Pine trim, burlap panels, Wood Beams



SECTION thro' HALL



NORTH ELEVATION OF HALL.

Sheeted ceiling, pale green showing-

HOUSE IN PARK ROAD, TORONTO.
BURKE & HORWOOD, ARCHITECTS.

The Canadian Architect and Builder

VOL. XVI.—No. 185. MAY, 1903.

ILLUSTRATIONS ON SHEETS.

House in Prince Arthur Avenue, Toronto.—Bond & Smith, Architects.
Methodist Church at Windsor, N. S.—Elliott & Hopson, Architects.
Royal Bank of Canada, Sydney, N. S.—J. C. Dumaresq & Son, Architects.
Saint Mary's Church, Parish House and Rectory, Walkerville, Ont.—Cram, Goodhue & Ferguson, Architects.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

The Allan Homestead, Moss Park, Toronto.
The Triumph of the Drama—Decorative Painting for Centre Panel of Proscenium Arch, Russell Opera House, Ottawa—By Frederick S. Challener, R.C.A.

CONTENTS

Editorial	75-76	Wire Glass Windows	83
Apartment Life	77	Architect's Accounts	84
Fireproof Floor Construction	78	Architectural Education in Germany	85-86
"Slip-Shod Tendering"	78	Proposed Technical Institute for Montreal	87
A Possible Solution of the Sky-Scraper Question as Bearing on the Subject of City Hygiene	78	Notes	89
By the Way	79	O. A. A. Examinations	90
Heat Resistance of Building Materials	80	Tests of Materials	90
Northwest Letter	81	Painters and Decorators Convention in Toronto	90
Jottings from an Architect's Notebook	82	Fixing Tiles	90

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PROF. S. H. CAPPER, R.C.A., Department of Architecture, McGill University, Montreal
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" S. H. TOWNSEND, " "
" FREDERICK G. TODD, Landscape Architect, Montreal
" W. H. ELLIOTT, Toronto.
" J. C. B. HORWOOD, Architect, Toronto.
" A. F. DUNLOP, R.C.A., Architect, Montreal.
" FRED. T. HODGSON, Architect, Collingwood, Ont.

Scarcity of Slate.

Unusual activity in building construction coupled with difficulty in securing skilled quarrymen are believed to be the principal causes of the present scarcity of roofing slates. Scarcity of skilled labor in this line also prevails in Wales, so that no workmen can be imported with which to extend operations on this side the Atlantic. The past winter is said to have been an unfavorable one for slate quarrying operations, frequent thaws and rains causing the loss of large quantities of material. If the necessary labor can be obtained this should be a favorable time for the development of the extensive slate deposits in Newfoundland, as prices are said to be higher than at any period during the last twenty years.

The Colonial Style Run Riot.

We are pleased to note the tendency in the United States to substitute for the Colonial style in domestic architecture; half-timber and other forms of construction following closely the best English examples. The supremacy of English house and church architecture cannot be doubted, while the so-called Colonial architecture of these days has become an abomination. In some of the newly built up residence districts of Toronto and other Canadian cities may be seen whole streets of houses, the fronts adorned with porches and verandahs of the so-called Colonial style, each being an exact duplicate of all the others. The effect is monotonous in the extreme, and the person who is obliged to look on these houses day after day learns to abhor white porches and verandahs. True, these serve a useful purpose in our climate, but why should there not be variety in design and material, thus imparting to them individuality and interest? Of course they could not then be designated Colonial, but they would be none the worse for that.

Protection of Buildings from Lightning.

The Committee of the Royal Institute of British Architects and the Surveyors Institute appointed two years ago to investigate the subject of the protection of buildings from lightning, expect to present their report at the close of the present year. Meanwhile some details have been given out of the reports already sent in by the committee's observers. These contain a list of sixteen protected buildings struck by lightning and more or less seriously damaged, including a considerable number of churches, lighthouses and factories. One of the most interesting cases so far reported, and one which seems to show that the so-called protectors sometimes tend to induce lightning stroke, is that of a large country house in Sussex, erected some twenty-eight years ago, and till recently without any form of protection. In 1901 a church in the immediate neighbourhood having been struck, the owner of the house, for greater security, decided to have lightning rods put up. An elaborate system was installed and completed in March, 1902, nearly every portion of the building having its own finial and conductor. During the storm season of last year the house was twice struck—on June 17 and

August 8. On each occasion, besides other injuries a chimney stack was damaged, the brickwork being split up and the capping-stones dislodged and hurled about in all directions. The lightning-rods on the damaged chimneys were torn from their supports and much bent. Careful study will be given by the Committee of all the cases reported, and an effort will be made to suggest better methods of protection than those at present employed.

Over-Production of Cement.

The losses arising from over-production in the manufacture of Portland cement in Great Britain and Germany have already been alluded to. From data recently published it appears that in Russia from the same cause the industry has also become unprofitable. Until 1896 there was only one cement factory in Russia, the Black Sea Company, a German concern, at Novorossik, with a yearly output of 30,000 barrels. Two years later owing to increased demand, there were eight factories. In spite of the fact that the consumption of cement rose from 409,000 barrels in 1896 to a million and a half barrels in 1901, the rapid increase in manufacturing capacity forced prices down in 1900 to a point where the older factories paid no dividends and the newer ones suffered heavy losses, and in some instances were obliged to go out of business. Efforts are now being made to put the industry on a paying basis by forming an association of the manufacturers to control prices and by manufacturing at home the cement casks which heretofore have been imported from Poland. There is a lesson in all this for the present manufacturers of cement in Canada and more especially for persons who contemplate engaging in the business. The manufacturing capacity in this line has increased very rapidly in Canada within the last five years, and has almost if not quite reached the safe limit. Notwithstanding the greatly increased demand of late for cement for construction work in which other materials were formerly employed as well as for new uses, manufacturers of cement should take warning by the experience of the countries we have mentioned, and be careful not to let the supply outrun the normal demand.

Defensive Methods of Employers.

There is a growing disposition among employers of skilled labor to co-operate with each other in resisting the ever growing and intolerant demands of organized labor. It is beginning to be understood that if employers are to have any rights whatever or any control over the businesses to the building up of which their capital and best efforts have been devoted, they must stand together and support one another in a more determined manner than they have done in the past. The benefits of such co-operation received illustration recently in one of the smaller cities of Western Ontario. The union workmen in the employ of a contractor struck work because some fault had been found with them. They were aware that building mechanics were being advertised for by some of the other local contractors who were expected to welcome them. Their former employer, however, advised his fellow contractors by telephone of the circumstances of the case, and when the strikers applied for employment they were invariably met with the reply that no help was required. This had the effect of reducing their arrogance and they returned to work. Another case was that of the Penberthy Injector Co., of Detroit, to whom the alternative was presented by the Brass Workers' Union of discharging a non-union workman or contending with a strike. The Penberthy Co. brought the facts to the attention of the principal manufacturing firms of the city, forty-seven of which met and passed a resolution asserting the equal right of every man to employment, and pledging their support to the Penberthy Co. in resisting the unjust demands made upon them. It is understood that a movement is now on foot having for its object the organization of employers of labor throughout the province of Ontario.

No Outside Interference.

A strong protest has recently been entered in several quarters against interference with and control of Canadian labor organizations by the leaders of the International Unions of the United States. Archbishop Bruchesi recently caused to be read a pastoral letter in all the Roman Catholic churches of Montreal, urging Catholic workmen to keep clear of entangling alliances which would make them subservient to the mandates of foreign organizations having little knowledge or sympathy with the conditions existing between employers and employes in this country. The letter goes on to say: "Calmness and reflection will make you realize that there are just limits to your demands. You cannot reasonably expect that the workingman's wages will be ever on the increase, and that at the same time the hours of labor will decrease proportionately." In the Senate at Ottawa a discussion recently took place on this subject in connection with a Bill to amend the Criminal Code respecting offences connected with trade and breaches of contract. Hon. William Gibson was not opposed to labor unions per se, but objected to foreign dictation. He referred to a case in Hastings County where a company was wiped out by a strike ordered from Washington. Almost every labor union was directed from Washington. He advocated prohibiting international unions. They would effect settlements more easily, and have fewer strikes. He hoped the bill would be made so that they could indict the lodges. He read a letter received on May 17 from the Beamsville branch of the Journeymen Stonecutters' Association of North America, demanding $3.50 a day for nine hours. The letter went on: "We have been notified by the Niagara Falls branch not to send stone into their jurisdiction." He was not only told what he was to pay the men, but that he must not cut stone to be used in another jurisdiction. He hoped the bill would be enlarged, so as to make the men amenable to the law, and strike at the root of the matter. Hon. James McMullen said it Canadian labor organizations were to be controlled from the United States, Canadians would be unable to take contracts, because they did not know when a strike might be ordered. If some American institution was desirous of crippling a competitive institution here, all they had to do was to approach the head center, tip them the wink, point out how a service could be rendered. A strike would ensue, and the Canadian owner would be the loser. He was surprised at the attitude of the press. There did not appear to be a paper in Canada that had the courage to come out boldly on this question.

DADO DESIGN BASED ON LILIES. FROM "PLANT FORM AND DESIGN."

APARTMENT LIFE.

The growth of the apartment idea is not an unmixed gain. There are few more important words in the English language than the word "home," and it is about to acquire but a modified meaning to those persons who intend to adopt a life in the apartment houses that are beginning to rise in our big cities.

Home is a place which shuts off the world at the street door; a place must be separate, self-contained, and in some sense our own to give properly the feeling of home; and an apartment is these things only in a modified sense. It is little more separate or self contained than a suite of rooms in a boarding house would be; and proprietorship in an apartment, even if held by purchase, cannot compare with the proprietorship which extends down to the ground and includes some portion of it. A lodging in the air is not perfectly a home "barring you're a bird."

In the second place, though home to be home must shut its inmates off from the world, it must also, for people of refinement, provide for their separation from one another. The essence of house planning is in the effort to keep functions and people apart. The upstairs and downstairs arrangement of a house gives a definiteness for this purpose which one never realizes so clearly as when looking over a "flat." On a level, particularly when, as so often happens, it is made necessary to pass all the bedrooms on the way from the entrance to the living rooms—privacy is more difficult. A delicate woman, who wishes to lie down during the day, imposes restraint on all the inmates; or else becomes accustomed to less consideration than she would receive in a house. There is too great nearness of the inmates as a matter of feet and inches, and this is likely to result in too little distance in the matter of relations with one another. A delicate woman is apt to become indelicate woman in the matter of appearances in dishabille, which the comparative privacy given by the different levels of a house should prevent.

The ideas of home and family are closely connected, but what is to be done with children in a flat? There is no upper room where they can play and make as much noise as they like; nor is there likely to be any ground outside, and if there is it is public ground. This is not the same thing as ground, however small, apart from the rest of the world, where children can have room for their own numerous private affairs. A very simple habitation, if it has room for these, will, to a family of children, be dignified by all the sentiments which home inspires; sentiments which make childhood a memory and prepare the way for the domestic and patriotic ideas with which it is so important that the manhood and womanhood of a nation should be possessed. Large families are in themselves the making of a home; but what is to be done with a large family in a flat? What was always a troublesome joy is likely to preponderate so much on the side of trouble as to cease altogether to be a joy; and then there is danger of it's ceasing to be at all. The happiness of a woman does not seem to consist now as it did in the early days of the world, in being the mother of children. Domestic life has ceased to be to her her necessary field of work. Men, much as they hate work, do seem to acquire a sort of enthusiasm for the proper fulfilment of it; it is their life. But women seem not to regard domestic duties as their life, but as an irksome addition to their life. Their confabulations about it have a tone of discontent. They incite one another continually to desire greater freedom from care. The woman who is most envied is she who has the least care. Not only is pride in their families vanishing but pride in their housekeeping as well; and apartment life will complete the process. With no families and almost no housekeeping—for, with soup in paper boxes and fried potatoes in a bottle, a woman has little to think of now if she has credit and a telephone—with nothing to do at home, women may fulfil their ideal; but will they not also fulfil the warning of St. Paul and "learn to be idle, wandering about from house to house; and not only idle, but tatlers also and busybodies, speaking things which they ought not."

It is pertinent to enquire whether the solution of the housing question, most suited to our national traditions and character, does not lie in radial railways, that will enable us to keep touch with the town while spread over the country, rather than in a system of housing that will pack us, six or eight families deep, over so much land only as is comprised within the area of a concreted cellar.

The essence of the question is in reality the necessity of giving children an opportunity for outdoor life at home. Playing grounds are all very well as a remedy, but we should avoid the extremity that requires them. It has long been a subject of lamentation that the poor and the children of the poor should live and play on the street; it will be lamentable indeed if the children of the comparatively well to do are brought to the same condition. This extreme as well as the other is exemplified in New York, and should furnish a warning to aspiring cities. In New York, a long way up, in the Harlem neighborhood, the streets on which the residential flats are built are full of respectably dressed children; running about in the road among the horses, sitting on the dirty sidewalk, playing ball over the heads of the passers by. One receives an impression that they have just got out of school and are lingering before going home. The discovery that they have got home, that this is their home, gives a shock when it is first realized. All the streets in the neighborhood exhibit the same state of things. A little investigation

shows that it is unavoidable. A popular flat, only six storeys high, with a hundred feet of frontage; inhabited by marred people chiefly, clerks of some standing; a lawyer or so, a couple of doctors, and people of that sort; shows on its plan but scanty accommodation for children. Most of the apartments have one bedroom or two; none have more than three. Yet, when the rooms available for children are counted up, there appears without squeezing, and there must be a good deal of squeezing done in these apartments—possible room for fifty children. Across the road there is an apartment building of similar size, and others all along the street. This simply means that the children in that street might line both sides of the road; that, if they all played at home, the hundred running feet of street in front of the apartment building examined might have to suffice for the playground of a hundred children. It is not likely there are so many; but that is an evil on the other side, for there ought to be twice as many. It looked a miserable state of affairs. "Boys" John Boroughs says "live in a world that is inhabited entirely by boys;" but the boys in these streets must have another view of life thrust upon them, and perhaps this may have something to do with the elderliness of the American boy, about which his fellow countrymen sometimes complain.

There seems to be a tendency to hail the advent of apartment house building as a solution of every difficulty; but there is evidently something to be said on the other side. If they were regarded only as a final necessity; as something to be avoided as long as there is any other way of convenient housing; it would probably be nearer the truth, and we should turn our attention first to what is more really a development of our own times—the application of the means of rapid transit to enable men who work in the city to live in the country where land is cheap.

W. A. LANGTON.

FIREPROOF FLOOR CONSTRUCTION.

Mr. Frank Caws, F.R.I.B.A., recently gave an address on "Fireproof Floor Construction" before the Edinburgh Architectural Association. Referring to the modern use of Portland cement and iron in floor construction, Mr. Caws said that generally speaking the introduction of steel girders as supports for the concrete has been carried to a very unwise excess, inasmuch as the action of fire upon the steel, causing it to expand, made it most injurious to the concrete floors, and, instead of being a support, it proved in such cases the means of their destruction. Therefore, he advocated a method of constructing floors in large slabs of concrete, with a minimum amount of steel bearers, so disposed and protected from the fire as to give the necessary support without introducing an element of weakness. In this connection the results have been published of a test of two hours duration in October last by the British Fire Prevention Committee of a floor of fire supports and oak flooring. The floor was 22ft. 3in. by 10ft. in the clear, and consisted of two 10in. by 12in. beams of yellow fir placed across the testing-hut, with four 10 in. by 10 in. joists notched into them at 2 ft. 6 in. centres, oak boards 8½ in. wide and 2½ in. thick being spiked on top; a 15 in. by 15 in. yellow fir post supported the floor in the centre. The floor was loaded with 232 lbs. to the square foot, distributed. In 4 minutes smoke issued from the joint between the parapet-wall and the oak flooring. In 89 minutes flame first came through the floor. In 109 minutes a small portion of the oak flooring fell. The post, beams and joists were considerably reduced in size and charred, the post to a depth of about 1¼ in. and the beams and joists about 2 in. The average temperature of the fire was about 1,400 degs. Fahr.

"SLIP-SHOD TENDERING."

To the Editor of the CANADIAN ARCHITECT AND BUILDER:

Sir,—In reference to your April article "Slip-Shod Tendering," I wish to say that contractors are not alone to blame for this. They are often asked to submit tenders for work which is not clearly described by either drawings or specifications; probably no lot grades are given and sewers and drains which must be connected with, are not located. In many cases several alternative figures are asked for different designs and finish. Now under these circumstances, a contractor must spend considerable time and perhaps money in preparing an intelligent estimate. If quantities were supplied him or compensation for tendering, as is done in some countries, the case would be quite different. As it is however he frequently finds that he has spent his time (which is the same as money to most contractors) for nothing, not even a chance for the job, which either does not go on at all or goes to a previously selected builder, estimates being asked for simply to set the price.

In my opinion these are some of the reasons why contractors are tempted to do so much guessing and why this will continue until such time as both architects and builders are organized to that extent that they can compel clients to pay a fair price for valuable information.

An architect should be competent to estimate to within 10 per cent. of the cost of most buildings; close enough at least to enable his client to decide when and what to build. To call upon perhaps a dozen busy men to give their time gratis to help to decide these points is scarcely honest.

Yours truly,

A. C. C.

VANCOUVER, B. C., May 18, 1903.

A POSSIBLE SOLUTION OF THE SKY-SCRAPER QUESTION AS BEARING ON THE SUBJECT OF CITY HYGIENE.

To the Editor of the CANADIAN ARCHITECT AND BUILDER.

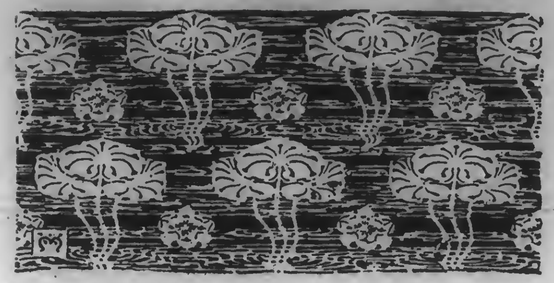
SIR,—Mr. Langton's pertinent treatment of the question of "High Buildings" in your last issue leads me to suggest a possible way out of the dilemma might be for Manhattan and other cities to legislate in a way to limit them to two out of every three of the buildings forming the line of the street tenements.

Two tall buildings could thus adjoin each other—the lots supposed to be some 25 to 30ft. frontage, more or less—leaving a space between for light and air. In this way each of the taller structures could have windows along one side or party wall of the building. This would form a not objectionable crenelated series of tenements; the vertical protuberances starting from above the 5th, 6th or 7th story of the row of structures, according to width of street, as along the Paris boulevards, with a continuous cornice or entablature at that height.

Each proprietor of a high building adjoining the lower structure, should be bound to equalize advantages by making over to the proprietors of the low or stinted block, one-third of the net profits derivable from the upper stories of the higher structures after duly allowing for interest on net cost thereof, and other charges considered fair in the premises.

CHAS. BAILLAIRGE, C. E., Quebec.

Professor Ramsey, in a lecture at Carpenters' Hall, London, said that it is a common practice to attempt to hasten the drying of new buildings by leaving the doors and flues open, but he thought it would be more rational to close these vents, and to use charcoal braziers in the closed rooms. The hot gaseous carbonic acid evolved from the burning charcoal would flow through the walls, and the carbonic acid would materially accelerate the conversion of the lime in the mortar into carbonate of lime; the passage of the hot carbonic acid through the walls would not only dry out the water, but would increase materially the rate of conversion of the lime into carbonate of lime.



WATER-LILY STENCIL FOR WALL HANGING. (FROM "PLANT FORM AND DESIGN.")

BY THE WAY.

The latest specimen of "tinsel" architecture, of which alas! there are already too many examples, is reported from California. The builder of a frame house is said to have applied to the exterior while the paint was still wet, a rough-casting of sand and fine blown glass.

× × ×

The purchaser of a furnace sued the manufacturer to recover the price, alleging that the furnace would not perform the guaranteed duty. In proof that the furnace was a poor heater he cited the fact that while it was being run to its full capacity, a barrel of beer placed on top of it had frozen.

× × ×

A factory is to be established at St. Mary's, Ont., for the manufacture of Portland cement. The intention is to use in the process crushed limestone instead of marl. The promotors of the enterprise claim that by this means the cement can be produced more cheaply than by the method now employed.

× × ×

George Ley, whose luck at cards was proverbial, resolved to build his residence at Combe Martin, North Devon, England, in the form of a pack of cards, split up and erected castlewise. The idea was carried out thoroughly and the edifice equipped with fifty-two windows—one for each card—while its form necessitated a plethora of chimney stacks.

× × ×

The visitor to Washington is delighted with its clean streets, its extended boulevards, resembling those of Paris, and its magnificent public buildings, especially the Capitol, the Art Gallery and the Congressional Library. The latter with its beautiful mural decorations is alone worth many hundred miles of travel to see. The domestic architecture of Washington, with few exceptions, is however, the most commonplace of any that I have visited in the United States. We have been accustomed to believe that a few good examples of architecture placed about a city must tend to leaven the whole architectural lump. If that be true, Washington must be regarded as the exception which proves the rule.

× × ×

It is reported that Mr. Flavelle's handsome house in Queen's Park, Toronto, is likely to be purchased by the Ontario Government as a place of residence for the Lieutenant-Governors of the province. The house and its surroundings would seem to be well adapted to the purpose. If this change of location of the governor's residence be made, the City Council of Toronto should purchase for park purposes the present government house and grounds. The building, although somewhat out of date, appears to be in a fair state of preservation, and could be put to some public use, as for instance a museum. The grounds have been carefully kept, and contain some fine trees. They would give a pleasant breathing spot in the center of the city, the lack of which is becoming more acutely felt as population increases.

× × ×

Surgeon-Captain K. Tamura, of the Imperial Japanese Army, in a recent address to the military surgeons of the United States, called attention to the use of paper for windows in Japan, in place of glass. He referred to the fact that where no ventilation can take place through glass, the air passes through the paper quite freely. Moreover, the texture of the paper is such that, while admitting the air, it prevents in some degree the passage of germs through it. This point was determined by counting the number of colonies of bacteria developed on media inside and outside the house. It was thus found that 97 per cent. of the bacteria of the air were removed. The speaker summed up in the adroit Oriental way: "It is well known that a citizen of Paris inhales 7,500 bacteria germs in a day; one in Berlin, 5,000 of them. We Japanese, who live in air containing three times as many as Berlin and twice as many as Paris, inhale only 2,000 bacteria germs in a day, simply because we use paper for the windows of our homes."

× × ×

"Punch" in the following lines depicts the sorrows of the professional man who is regarded as being either too young to be trusted or too old to be efficient:—

Two men there dwelt upon a time
Within a certain city.
Both were distinctly men of parts
Well versed in their respective arts.

To fell diseases of the kind
That everyone who can shuns
One of the pair had turned his mind,
The other's forte was mansions.
They were, as you'd no doubt expect,
A doctor and an architect.

The latter, when but twenty-nine,
Planned a Titanic building,
A house of wonderful design,
All marble, stone and gilding,
Said he: "My fortune's made, I wis,
Men can't resist a thing like this."

With eager hope his heart beat high,
He took his plans up boldly,
And thrust them in the public eye:
The Public viewed them coldly.
"Pray take that rubbish right away,
You're far too young for us," said they.

The doctor's was a novel treatment for consumption, but the public sternly rejected it also—

Apparently you quite forget
That you are barely thirty yet.

The years rolled on,

And then—the Public changed their mood!
Their hearts began to soften.
They felt the doctor's cures were good
(They'd had that feeling often).
They also chanced to recollect
The merits of the architect.

"Come plan us mansions, bring us pills."
Their cry no answer rouses.
No one alleviates their ills,
No one designs them houses.
Upon enquiry it appears
Each has been dead for several years.

On April 26th the feast day of St. Mark, the Count of Turin, representing the King of Italy, laid the corner stone of the New Campanile at Venice in the presence of 30,000 spectators.

HEAT RESISTANCE OF BUILDING MATERIALS.

At the recent meeting of the American Society of Mechanical Engineers a paper was presented by Mr. William Kent proposing the use of the reciprocals of the values of heat conductivity of substances in order to facilitate the comparison of different combinations of the substances. As stated in the report of the convention, he makes the coefficient of heat resistance or heat insulating power of a substance equal to unity divided by the number of British thermal units transmitted in one hour by a slab 1 square foot in area and 1 inch thick per degree Fahrenheit of difference of temperature between the two faces of the slab, both surfaces being exposed to still air. In this way the total resistance of a combination can be indicated by the addition of the several resistance coefficients. The author points out, however, that while the coefficient is thus a constant quantity for a given substance, it can only be so considered when the differences in temperature of the air on the two sides of the slab are small—say, less than 100 degrees Fahrenheit. When the temperature range is great, experiments on heat transmission indicate that the quantity of heat transmitted varies not directly as the difference in temperature but as the square of that difference.

The question of the effect of surface resistance when the surface is in contact with air or with another body, the author treats as follows: "Authorities on the subject of heat transmission generally agree that the resistance to the passage of heat through a plate consists of three separate resistances; viz., the resistances of the two surfaces and the resistance of the body of the plate, which latter is proportional to the thickness of the plate. It is probable also that the resistance of the surface differs with the nature of the body or medium with which it is in contact. Thus a very rough surface on a metal plate would be likely to transfer more heat to adjacent air than a smooth surface would, since it has a greater area in actual contact with the air, while two rough surfaces of metal touching each other would transmit from one to the other less heat than two smooth surfaces."

He has computed the figures for heat resistance of several insulating substances from the figures of conducting power given in a table published by Mr. John E. Starr, in a paper on "Insulation for Cold Storage," published in "Ice and Refrigeration" for November, 1901. Mr. Starr's figures are given in terms of the British thermal units transmitted per square foot of surface per day per degree of difference of temperature of the air adjacent to each surface. The author's figures, the coefficients of heat resistance, given in the second column of the accompanying table, are calculated by dividing Mr. Starr's figures by 24, to obtain the hourly rate, and then taking their reciprocals.

"Analyzing some of the results given in the last column of the table, we observe that, comparing Nos. 2 and 3, 1 inch added thickness of pitch increased the coefficient 0.74; comparing Nos. 4 and 5, 1½ inches of mineral wool increased the coefficient 1.11. If we assume that the 1 inch of mineral wool in No. 4 was equal in heat resistance to the additional 1½ inches added in No. 5, or 1.11 reciprocal units, and substract this from 5.22, we get 4.11 as the resistance of two ⅞-inch boards and two sheets of paper. This would indicate that one ⅞-inch board and one sheet of paper give nearly twice as much resistance as 1 inch of mineral wool. In like manner any number of deductions may be drawn from the table, and some of them will be rather questionable, such as the comparison of No. 15 and No. 16, showing that 1 inch additional sheet cork increased the resistance given by four sheets 6.67 reciprocal units, or one-third the total resistance of No. 15. This result is extraordinary, and indicates that there must have been considerable differences of conditions during the two tests."

HEAT CONDUCTING AND RESISTING VALUES OF BUILDING MATERIALS.

Brick Wall: Thickness.	Cond.	Res.	—Revised.— Res.	Cond.
4-in.	0.68	1.47	1.50	0.667
8-in.	0.46	2.17	2.30	0.435
12-in.	0.32	3.03	3.10	0.323
16-in.	0.26	3.85	3.90	0.256
20-in.	0.23	4.55	4.70	0.213
24-in.	0.20	5.00	5.50	0.182
28-in.	0.174	5.75	6.30	0.159
32-in.	0.15	6.67	7.10	0.141
36-in.	0.129	7.75	7.90	0.127
40-in.	0.115	8.70	8.70	0.115

Wooden beam construction, planked over or ceiled:	Cond.	Res.
As flooring	0.083	12.05
As ceiling	0.104	9.71
Fireproof construction, floored over:		
As flooring	0.124	8.06
As ceiling	0.145	6.90
Single window	1.030	0.97
Single skylight	1.118	0.89
Double window	0.518	1.93
Double skylight	0.621	1.61
Door	0.414	2.42

The author has also calculated the coefficients of heat resistance from the heat transmission figures of various building materials, as given by Mr. Alfred R. Wolff, based on German experiments. These values are reproduced in a table herewith, the first column giving the conductance, in British thermal units per hour, and the second, the reciprocals, or heat resistances. It will be noted that there is an irregularity of the differences in the value of the resistance for each increase of 4 inches in thickness of brick walls, which the author holds to indicate a difference in the conditions of the experiments. He finds the average difference is 0.80 and that the approximate formula for the resistance is 0.70+0.20 t, in which t is the thickness in inches. In the third and fourth columns are given the revised values of the resistance and conductance, respectively ascertained in accordance with his formula. —Engineering Record.

HEAT CONDUCTING AND RESISTING VALUES OF DIFFERENT INSULATING MATERIALS.

	Conductance.	Resistance.
1. ⅝-in. oak board, 1-in. lampblack, ⅞-in. pine board (ordinary family refrigerator)	5.7	4.21
2. ⅞-in. board, 1-in. pitch, ⅞-in. board	4.89	4.91
3. ⅞-in. board, 2-in. pitch, ⅞-in. board	4.25	5.65
4. ⅞-in. board, paper, 1-in. mineral wool, paper, ⅞-in. board	4.6	5.22
5. ⅞-in. board, paper, 2½-in. mineral wool, paper, ⅞-in. board	3.62	6.63
6. ⅞-in. board, paper, 2½-in. calcined pumice, ⅞-in. board	3.38	7.10
7. Same as above, when wet	3.90	6.15
8. ⅞-in. board, paper, 3-in. sheet cork, ⅞-in. board	2.10	11.43
9. Two ⅞-in. boards, paper, solid, no air space, paper, two ⅞-in. boards	4.28	5.61
10. Two ⅞-in. boards, paper, 1 air space, paper, two ⅞-in. boards	3.71	6.47
11. Two ⅞-in. boards, paper, 1-in. hair felt, paper, two ⅞-in. boards	3.32	7.23
12. Two ⅞-in. boards, paper, 8-in. mill shavings, paper, two ⅞-in. boards	1.35	17.78
13. The same, slightly moist	1.80	13.33
14. The same, damp	2.10	11.43
15. Two ⅞-in. boards, paper, 3-in. air, 4-in. sheet cork, paper, two ⅞-in. boards	1.20	20.00
16. Same, with 5-in. sheet cork	0.90	26.67
17. Same, with 4-in. granulated cork	1.70	14.12
18. Same, with 1-in. sheet cork	3.30	7.27
19. Four double ⅞-in. boards (8 boards), with paper bet. three 8-in. air spaces	2.70	8 89
20. Four ⅞-in. boards, with three quilts of ¼-in. hair bet. papers separating boards	2.52	9.52
21. ⅞-in. board, 6-in. patented silicated strawboard, finished inside with thin cement	2.48	9.68

NORTHWEST LETTER.

WINNIPEG, MAY 11, 1903

The open spring this year has been most favorable for building of all descriptions and has allowed the work to get under way considerably earlier than last year. Excavations, large and small, can be seen everywhere from the centre of the city to the outlying districts in the suburbs, and everything is activity in the building line. Some of the foundations of the smaller work have already approached the ground level and where the building is frame many are well covered in.

Before taking up the new work it would be in order to mention the two or three large works that were started last year and are now at the point of completion.

The Strathcona Apartment Block is the most noteworthy in this list. It is a building that will be welcomed by the great class who live in "Rooms". The population of Winnipeg has increased so during the past twelve months that house accomodation has become a most serious question and one that is already having an adverse effect on incoming residents and resulting in temporary detriment to the city. The opening of the Strathcona will therefore be heralded with delight by a host who at the present moment may be living more or less like sardines in a box. It will relieve the pressure in this direction to some small extent, but will not in any way settle the important question of housing. Winnipeg is a most favorable place for apartment buildings as the population for the most part is a very transient one and buildings of this description are ensured financially as being a most paying investment. To describe the Strathcona building is not a very serious undertaking as everything inside and outside has been carried out in the most simple manner. The building is constructed of the common gray brick, it is four stories in height with a high basement. On plan it is a square with a large centre court. From this court is arranged an entrance in each corner to the building proper which divides the whole into four separate parts. On the ground floor, first floor, and second floor each part is divided into two suites of from six to eight rooms with bath room accommodation for each suite. The finish of the main portion on ground and first floors is in oak and on the second floor maple. The top floor is reserved for bachelors' quarters and divided into separate and double rooms. What appears to be an omission especially in a building of this description is the lack of a passenger elevator, but in the planning of the work it may have been found undesirable. The use of metal ceilings throughout is a feature that strikes one as being most objectionable, and one that would not be tolerated in a very ordinary residence.

St. Mary's Academy is another building that was started last year and will be completed in the course of a couple of months. This building has apparently been designed with the object of getting the most accommodation for the least amount of money. Externally, the work is so extremely simple and the lines so hard that the general effect is most disappointing and a crudity in design pervades the whole work. Inside everything has of necessity been kept as simple as possible and even the Chapel, which in these Institutions is generally made a special feature is, from all appearances, being treated in keeping with the rest of the work. The tenders for this building were originally much in excess of the anticipated cost and consequently everything had to be reduced to the simplest form.

St. Stephen's Church, although not yet complete, will from present indications be one of the most interesting Churches in the City. It is faced with Tyndall stone thoughout and makes a very substantial looking block. The Sunday School forms part of the same building and the uninitiated on entering is much surprised at the small area of the body of the church. This of course may not have the same effect when the seats, etc., are arranged in position. The Church will be open for service in the course of a few weeks.

Of the new work already begun the Bank of British North America is the largest. This is to be a four-storey building, the ground floor space reserved for the Banking room and the upper floors as Offices. The front will be of Bedford stone with pilasters, cornice, pediment, etc., and when completed will rank among Winnipeg's finest buildings.

The Steele Apartment Block which has already part of the foundations in is to be a brick building of simple character and has been designed on strictly utilitarian lines.

Of the Warehouses in course of construction, and there is a great number, the Stobart building is the largest. The foundation walls are now being rapidly pushed.

The postponing of the C. P. R. improvements indefinitely, is most regrettable, and it is an action that touches the general welfare of the City. The suspension of operations on this work will affect the North end most directly and will cause building in this district to be put off until arrangements have been finally decided upon. The cause of the delay is due to a question of legal claims that will be instituted against the City by property owners in the vicinity of the proposed subway. As the amount of these expected claims is an unknown quantity and might with all reasonableness reach an extremely high figure, it appears to be a most important factor in the negotiations as to who shall be liable for all such claims that may be filed. As these improvements must be proceeded with in the near future it is to be hoped that a satisfactory understanding can be arrived at immediately and work begun.

A deputation from the Winnipeg Board of Trade left here some days ago for the purpose of interviewieg the Dominion Government on behalf of merchants and contractors of this city regarding the tardiness of the C. P. R. in their efforts to facilitate the shipping of goods and materials into the city. This subject cannot be placed before the Government in too trenchant terms as the prosperity of the West and especially of Winnipeg is dependent upon the speedy supply of materials from outside. If the C. P. R. officials are not at fault in this on the plea of increased traffic throughout the country the Government should take steps to devise some scheme that will insure the necessary movement of goods in this district. Building has already been stopped for several days on account of the lack of stone. The stone is quarried and in some cases loaded on the cars but the delay in the transporation of same to Winnipeg has caused valuable time to be lost by waiting.

The real estate boom here is now at its meridian, and city property is, from what I can learn, at a price it will not exceed for some time to come. Outlying districts have been surveyed and laid out, and a sufficient area has been plotted to satisfy the demands of an increasing population for the next decade. Prices asked for local farm lands are so high as to be almost probibitive to buy even as house property. Winnipeg is flooded with a myriad of real estate agents. Every other office is occupied by a real estate man or has desk room for one, and each has his alluring list of lands for sale to proffer the would be purchaser. Practically half of Winnipeg is for sale by this horde of ephemeral land agents, who foist up the price at each transaction and through whom property in some cases attains a remarkably fictitious value.

I regret that I am not able to forward you for illustration the plans of the Carnegie public library. Two sets of drawings have already been figured on, but the cost in each case is much above the stipulated cost. The plans of the third successful competitor are now being tendered on, and until the figures are received it is impossible to say what will be the next steps taken to proceed with the work of building a library.

W. PERCY OVER.

The cement, which was used in the decoration of the baptistry at Florence, was composed of wax, lime and resin. It was very good for its purpose, for it kept sufficiently moist for five to eight hours, and could during that time be worked as wax, and then it became as hard as stone and did not shrink.—Sir W.B. Richmond.

JOTTINGS FROM AN ARCHITECT'S NOTEBOOK.

Plinths, string courses, cappings, and other running members worked in stone should be in as long lengths as possible to avoid a multiplicity of joints, which will assuredly take wet in when the pointing fails. Internal and external angles to all such dressings are worked solid, and not mitre jointed. When any horizontal member abuts against a vertical wall, the member should be worked solid on a block which is to be built into and form part of the wall surface. Projecting members in soft stone are sometimes weathered with 5-lb. sheet lead in short lengths, dressed closely down on the stone; built at least 2in. into the horizontal joints along the inner edge, and projecting from ¼in. to ¾in. over the most prominent member so protected. In using lead to protect stonework, it should be left ree along one edge and end, for this material expands and contracts very perceptibly under the changes of temperature to which it is exposed in this climate; for the same reason it should be used in as short and narrow pieces as possible. Portland cement and lime putty are ideal materials for pointing the joints of stonework, assuming that the latter does dot expand and contract when subjected to extremes of heat and cold. But as it is a well-ascertained fact that stone, like metal, increases in bulk with an increase of temperature, it follows that any material used for stopping a joint in stonework must be stretched and compressed alternately, which action will ultimately destroy the jointing material as a watertight seal where it is inelastic. Hence a perfect material for jointing stonework should be possessed of some amount of elasticity—say, like asphalt. An open joint ½in. wide will take in less water than one 1-16in. wide, owing to the operation of a force called "capillarity." It is well known that if a piece of sugar is held in contact with water at one extremity, the fluid will rapidly pass into and moisten the whole lump. The same action may be observed by using a piece of ordinary mortar which has been thoroughly dried, especially if made with burnt ballast, or a piece of oven-dried sandy building brick. Where a stone or brick wall is damp on the inside, the bricks, stones, and mortar joints being perfect, the damp passes through the substance of these materials by capillary action. In a joint or crack where the adjoining surfaces are planes or irregular, and in contact at one or more edges or points, rain water will be taken up and held, or passed on to the inside by pressure from the outside. This peculiar action, due to what is sometimes called molecular attraction, another name apparently for capillarity, is observable in a closely slated roof, where a quantity of water is held after rain between the bed surface of one slate and the backs of those immediately underlying it. An open joint, where the surfaces are nowhere in contact, will be more weather proof than a close broken joint where the fissure is a mere crack. A window sill broken between the joints is generally the cause of a wet window back, and a sill damaged in this way should be wholly removed or repaired by cutting away the edges, and inserting a new block from 4 in. to 6 in. wide to the full width and depth of the sill. To attempt any repair of the cracked stonework by pointing with mortar, cement, or glazing putty is worse than useless. In this connection it is a question, when a wall is covered by a deep projecting cornice, whether it would not be advisable to set the stones on a sheet of lead, so that when the joints break, any water entering them may be caught and prevented from passing down through the wall. Sheet lead used in this way would perform the same office as a lead safe to a bath or w. c. apparatus; there is a difficulty, however, in the use of lead, especially in connection with lime or cement points, for the mortar may be converted into the carbonate (PbO, CO_2), in which case it would be quite useless. A stone gutter lying between the nave and aisle roofs of a sixteenth-century church was hollowed out 10 in. wide and 6 in. deep, the stones being from 16 in. to 18 in. long; the hollow was lined with cast sheet lead, which weighed orginally about 12 lb. to the foot; this lead lining leaked badly, and when removed it was found that more than half its thickness was converted into lead carbonate (white lead). Whether this was due to the presence of lime in the joints of the stonework or to rain-water, which was found between the lead and the stone gutter, it was not easy to determine, but the conversion of the metallic lead into the carbonate was no doubt commenced by pure rain water which in some way found an entrance to the joint between the lead and stonework. It is well known that clean metallic lead will, if dipped in rainwater exposed to the air, form a scale of what is probably lead hydrate, or hydrate and carbonate, a compound similar to ordinary pure commercial white lead. From the foregoing remarks it will be seen that the use of lead as a protective covering for structures may be advantageous in many cases, but it must be cautiously dealt with, allowing for free contraction and expansion, keeping it from contact with other metals in presence of moisture, and not exposing either surface to stagnant water in bulk, or merely a film which may be constantly evaporated and renewed. In many buildings it is a very common plan to let wrought-iron balusters directly into the ends of stone steps and landings. Where these are under cover, the oxidation of the ironwork does not take place so rapidly as when they are exposed; but all the same, in course of time, from the water used in washing the steps, and hygrometric moisture, oxidation sets in, and the iron rails burst the ends off the stone steps. It therefore follows that iron stair balusters should not be leaded into stone steps, nor is there any reason why they should be, for the flange of a rolled-steel string fixed under the outer ends of the steps and landings will not only carry and strengthen the staircase, but the walls may be drilled to take iron brackets, which, in turn, will hold the iron balusters. By adopting this plan all the stonework rests in the walls at one end, and on steel girders on the other. A thrust against the balusters and rail does not try the cohesive strength of the stone steps, but is transmitted to the steel ring, and both steps and landings are supported in the best possible way to carry their own weight and the weight of any number of people that may suddenly be brought on them, and this latter is an important consideration in a public building. Solid steps set in masonry have usually a lap of about 1 in.—that is, the tread of one step underlies the riser of the next 1 in. Steps having the soffits or undersides exposed are rebated or splayed where the riser of one step rests on the step underlying it. Steps supported on a wall at one end are usually in not less than 4½ in. The underside of each step may be horizontal, or splayed to form what is known as a "spandrel" step. In the first case the section of the step is a rectangle, in the latter a triangle.

Narrow staircases in church towers are worked circular in plan, a piece of the newel being worked in the end of each step; this newel is usually from 5in. to 6in. in diameter, and the whole staircase from 5ft. to 6ft. The steps may be rectangular in section or triangular. In such a staircase all the steps are worked to the same mould or template, and they are built in as the walls are raised. There is no ironwork needed in the construction of the stairs, as the steps are supported in the wall at one end, and on the newel at the other. The steps in eacb completed circle of a geometrical staircase should rise not less than 8oin. which would give 6ft. headroom, and allow 8in. for the thickness of a step.—Building News.

WIRE-GLASS WINDOWS.

The subject for which I shall have the honour of asking your consideration will be "Wire-glass, the Fire Retardant," a building material which tends to reduce to the minimum the hazard of conflagration, and conduces to the elimination of some risks attending the lives of us humble fire-fighters. The range of possibilities in fire protection is too wide to speak of here, if I am to be favoured with your attention, and only a small portion of it can be engaged in during the short session. I shall endeavor to advance that which I believe to be the most important factor in the protection of buildings against conflagration, and I shall be amply rewarded if I enkindle in your minds an inclination to seek more information upon the subject than I am enabled to communicate.

It is manifest to all thoughtful minds that the phenomenal development of the real estate values in our cities has made the tall building a necessity, and this necessity has brought with it the need of adopting in building construction barriers to conflagration, and there are to-day buildings capable of enduring without structural injury fierce, long continued interior and exterior flames and the application of cold water upon their heated surfaces. Structurally a building of this class is admirable—the foundations are secure, the walls and roof fireproof, but openings in walls and roof are necessary to render it habitable. Obviously the vulnerable parts of a building are the openings in the walls and roof—its doors, windows and skylights. To these openings the spread of flame is almost wholly attributable. This has been the history of so many destructive conflagrations that experts have long agreed that no structure in a closely built city can be considered even approximately secure against fire so long as it is provided with only ordinary windows, skylights and doors. My experience and observation have been such as justify this opinion, and I have most strenuously maintained that the quantity of wood contained in what I have termed "a structurally fireproof building," taking into consideration also the furniture and fittings, would, in the event of fire, endanger the property and the lives contained within it.

Shutters of iron or of metal-covered wood may protect windows if they are carefully closed, but in practice such shutters fall short of the purpose for which they were intended. When the crisis comes the shutter is frequently found open. Under the most favourable conditions an iron shutter at a fire is not the thing that the firemen want to come in contact with. Its rusty fastenings and blistering sides are objectionable, to say the least, and its reach, when it swings open, is liable to knock a man off the ladder. This is a risk to which the fire-fighter should not be subjected. There is no braver, manlier or more faithful set of men in the public service or out of it than the brave lads enrolled in our fire departments. I know of whom I speak, and I am well acquainted with the chances they take. They are ready to fight with death every day. Every year sees them saving life heroically or dying in their duty. Their work is as trying, difficult and dangerous as there is in the world. Yet they are not safeguarded. I know what ready fellows they are, and I feel that all known means of protection should be adopted to render their calling less hazardous.

Wire-glass is, in my opinion, the fire-stop for window and skylight openings—wire-glass set in metal frames. It supplies the requisite light and ventilation as well as protection against fire; its installation obviates the necessity of the cumbersome and unsightly hinged shutters and the projecting lugs and adjusters which support and secure them. It affords protection regardless of the janitor's neglect, because the thought of fire is not necessarily present in the mind of the tenant to induce him to close the window-sash, and when closed it prevents the ingress, egress or communication of flame. It enables the fire chief to size the situation and direct his men intelligently. The location and volume of the blaze are immediately disclosed, and if the conditions warrant it the fireman can effect an opening for the stream with his fire-axe.

Hard conditions, great risks and the sacrifice of large property and many lives are preliminary to the establishment of standards, and by such means wire-glass has come to be recognized as standard, and the degree of honour which is its legitimate due should be generally recognized.

Succinctly stated, wire-glass has yielded two fixed values as its contribution to fireproof building construction:—

It retards fire without hiding it—permits the blaze to declare itself.

It can be cracked, but it cannot be scattered. If fractured it retains its place.

Now we have to remember what we cannot forget, and we are mindful, thereof, of experiences which enable us to fully appreciate the value first stated. Of the many embarrassments to which the fire-fighter is subject, that which prevents fire from disclosing its location in its incipient stage is the most serious. Within the congested districts of our great cities our organizations are such as enable us to reach the scene of action and have our nozzles in hand within two or three minutes of the alarm, and if we could immediately get at the fire we would, in most cases have little difficulty in confining the blaze within the limits of the apartment in which it originated.

Modern science has equipped our departments with devices necessary to combat fire, the most contagious, virulent and disastrous of all perils to which buildings are subjected, and modern science has devised the means by which fire can be confined within the walls of buildings without rendering the same, inaccessible

*A paper by Edward F. Croker, chief of Fire Department, city of New York, read at the thirtieth annual convention of the International Association of Fire Engineers, New York.

to us, but the adoption of the means available is not general, and upon arriving at a fire we are frequently confronted with tin-covered and iron-clad shutters which obstruct our vision and our efforts to locate and conquer a blaze which becomes a conflagration, because of the precious moments lost in concentrating our energies upon the seat of trouble.

This condition has long been a serious menace in all cities, and it is now intolerable because the installation of wire-glass presents no technical difficulties. It is of acknowledged efficiency and no less economical than effective. It has withstood the severest tests, and its cost is well within the means of all building owners. The insurance companies give preferred rates when it is installed, and thus practically invest in it. Their scheme is to reduce hazards and in the belief that wire-glass effectually accomplishes this they induce its adoption by substantial endorsement. Its ability to abate horrors and loss which attend conflagrations in cities is ample justification of the reasonable laws providing for its adoption, and an exigent public duty is presented to building inspectors to prevent these laws being nullified by official inertia.

There is a region paved with good intentions, and many easy-going owners of buildings contribute to this paving fund by deferring the adoption of known means of protection and at the same time create occasion for regret from heavy financial loss and probable loss of life. I want to see the obligation placed upon owners of buildings to prevent such losses by the means which will effectually render fire non-communicative, and I think I have specified the means. The significance and overwhelming argument in favor of wire-glass as a fire-stop is the fact that when fractured it retains its place and continues to retard draught and its attending flames.

Doubtless many of the chiefs present have had occasion to recognize the efficiency of wire-glass as a fire-stop, and, of the many, Chief Musham's experience is especially worthy of reference. The fire which destroyed the Armour Lard Refinery, Union Stock Yards, Chicago, on the night of May 16, threatened for a time the entire district. Chief Musham was present, and he has stated that the wire-glass in the windows of the several walls prevented any communication through them and demonstrated the ability of wire-glass to prevent the spread of flame. The building destroyed was of recent construction, 100 feet by 400 feet, five storeys in height, and sub-divided into four sections by fire-walls, two of which were completely destroyed.

The quantity and nature of the material in combustion—refined lard—resulted in the hottest kind of a fire, and its intensity and duration are hardly comprehensible. The chief tells me that the flames reached to a height of 150 feet above the roof, and the combustion was so perfect that scarcely any sparks were observed.

I am quoting Chief Musham because I think perhaps his observation of wire-glass in this instance was under a better condition than can be conceived for an actual service-test of wire-glass. The entire interior of the building was of inflammable construction, made more so by being saturated with lard, and its five great floors were loaded with tons of this highly combustible product. Tanks containing thousands of gallons of rendering were exploded and their contents dashed against the walls and windows, and the intensity of the heat was so great that the walls holding the frames and sash which accommodated the glass crumbled, but until they fell the wire-glass retained its place.

This fire establishes conclusive proof of the efficiency of wire-glass as a fire-retardant and its staying qualities, and for the purpose of illustrating my subject I have considered it preferable to my own experience.

ARCHITECTS' ACCOUNTS.

General practitioners in medicine usually decline to give particulars of their charges, or even to state the number of times they have visited a patient. An Architect's account say the Builders Reporter, is presumed to offer less difficulty to those who wish to examine it, for it is taken to be at the most 5 per cent. on the outlay. When it is found that an account will not work out at that rate there is discontent. An example of the difficulty which people find in recognising any other basis was presented at some late meetings of the Guardians of Newton Union in Devonshire. New works were to be carried out in connection with the workhouse. For that purpose it was necessary to make plans of existing buildings, which were to be removed in order to furnish part of the site. Mr. Seger, the architect for that survey, claimed seven guineas. Some of the Guardians, including the chairman, declined to approve of the account, on the ground that the 5 per cent. commission was to include everything. The chairman repeatedly asserted that there should be only one charge, 5 per cent., and that he had never heard before of payment for plans of sites. However, the good sense of the majority prevailed, and the charge was admitted. It is hard that gentlemen holding administrative offices know so little of architectural practice as to imagine it is of so simple a nature that one charge can cover the vast variety of incidental work which may arise, and which the architect can no more be compelled to execute than to discharge the functions of a lawyer in connection with the building.

NOTES.

The death is announced of Prof. T. Roger Smith, for many years Professor of Architecture and Building Construction at University College, London. The late Prof. Smith was twice elected President of the London Architectural Association. He was also the author of a valuable work on acoustics.

France is about to start schools of architecture in the towns of Lille, Rouen, Nancy, Lyons, Bordeaux, Marseilles, and Toulouse. The course of study will last seven years, diplomas will be given, and the professors, from twelve to fourteen in number, according to the schools, will be elected by the Conseil Superieur des Beaux-Arts.

At a recent architectural conference in England, the ethics of the profession were made the subject of a paper and a discussion, but nothing practical followed. What is necessary in the interests of the profession says the Building News, is that fundamental points or questions should be settled once for all; such questions, for instance, as touting, interference with brother architects' work, calling on other architects' clients, inclosing testimonials to clients and members of committees, to competition promotors, accepting any work that would compromise any professional brother's position, giving evidence in courts of law prejudicial to architects, &c. These and other matters, if once decided upon in a representative conference of the profession, and the conclusions issued in a code to every practising architect, might be the means of uniting the profession; but it may be asked whether architects can ever agree on any subject of this nature?

ARCHITECTURAL EDUCATION IN GERMANY.

The usual requirements for admission to a German technical high school is a certificate showing that the student has completed his course in a "gymnasium" and has passed the graduating examination. This admits the holder to any university in the country. Foreigners are admitted if they can show that they have pursued a course of study in their own country approximately equivalent to that of a "gymnasium," but they are not allowed to take the Government examinations.

Anyone who wishes to take up some course or separate subject at the Hochschule, but is not able to fulfil the requirements for admission as a student, may be admitted as a Hospitant, or guest, simply attending the lectures, but not receiving any diploma at the end of his course.

The course occupies four years, and leads, for those who wish to enter the Government service, to the title of Baufuhrer, or "Director of Building," and, since October, 1899, also to the degree of "Doctor of Engineering." Those who do not enter the service of the Government, but have successfully completed their four years' course, receive a diploma to that effect.

The first two years are devoted almost entirely to theoretical subjects, or, at any rate, to subjects which do not pertain directly to architecture, but which it is well for an architect to know something about.

The subjects taught during each term are as follows:—

Winter Term: First Year.—This the first term of the first year (from the middle of October to the middle of April):—

Differential and Integral Calculus.—(5 hours' lecture: 1 hour's recitation.)

Analytical Geometry.—(2 hours' lecture.)

Descriptive Geometry.—(3 hours' lecture: 6 hours' drawing.)

Mechanics.—(3½ hours' lecture: ½ hours, recitation.)

Construction (Masonry and Carpentry).—(3 hours' lecture: 4 hours drawing.)

Architectural Drawing.—(3 hours.) Instruction here consists of copying architectural subjects in different mediums—pencil, charcoal, pen and brush, so as to become familiar with the handling of different materials.

Elements of Mineralogy.—(2 hours' lecture: 1 hour's recitation.)

Experimental Physics.—Mechanics, heat, acoustics and optics. (4 hours' lecture.)

The Summer Term is shorter than the first, lasting from the middle of April to the end of July. During this time, in the first year, the following curriculum is prescribed:—

Differential and Integral Calculus.—(3 hours' lecture: 1 hours' recitation.)

Descriptive Geometry.—(3 hours' lecture: 6 hours' drawing.)

Mechanics.—(7 hours' lecture: 1 hours' recitation.

Construction.—Foundations; walls and supports of wood, stone and iron; stairs and elevators of stone, wood and iron. (2 hours' lecture: 4 hours' drawing.)

Architectural Drawing.—(6 hours.) Devoted to the same subjects as during the winter term.

Elements of Geology.—(4 hours' lecture.)

Elements of Chemistry.—(6 hours' lecture.)

There is no summer work prescribed, and, therefore, none done. The drawing rooms are left open for the convenience of the students who have back work to make up. There are usually plenty of them.

During the Easter and Whitsuntide vacations, excursions (headed by some of the professors) are undertaken, places of special architectural interest being selected. These expeditions usually last about ten days.

The winter's work in the second year consists of 51 hours a week: 26 devoted to lectures and the other 25 to recitations and drawing. During this year the student gets to know a little more about architecture itself, but most of the subjects are still very theoretical and rather auxiliaries of architecture than architecture itself.

Here is the list of subjects taught during seccond year.

Mechanics of Elasticity.—(5 hours' lecture; 1 hour's recitation.)

Graphical Statics.—(1 hour's lecture.)

Study of the Forms and History of Ancient Architecture.—(3 hours' lecture: 6 hours' drawing.) This course also includes a careful and detailed study of the Orders, the copying of the best examples of ancient architecture, and one large and carefully executed design in either the Greek or Roman style.

Ancient Ornament.—(2 hours' lecture: 2 hours' drawing.

History of Ancient Art.—(3 hours' lecture.)

Construction.—(2 hours' lecture: 4 hours' drawing.

Architectural Building.—(1 hour's lecture.)

Modelling.—(4 hours).

Figure-Drawing from Casts.—(6 hours.)

Elements of Civil Engineering.—(3 hours' lecture.)

Elements of Surveying.—(2 hours' lecture.)

Technology of Building.—(3 hours' lecture.) By this is meant instruction in the manufacture of bricks, plate-glass, mining, casting of metals, and so on, the lecture being illustrated by the inspection of factories and plants in operation.

The summer term has 49 hours a week, of which 25 are taken up by lectures and 24 by exercises. The subjects are almost identical with those of the winter session. The lectures on the "History of Ancient Architecture" are replaced by others on "Romanesque Architecture"; likewise those on "Ancient Art" by others on the "Art of the Middle Ages." However, the drawing and designing of the course in ancient architecture is kept up. With the third year the real architectural work begins. All the preparatory work is accomplished, and now the students are first acquainted with the various styles of architecture and with the principles of design.

A few large problems are very carefully worked out, with a couple of smaller ones interspersed. The styles in which these designs are to be carried out are usually prescribed, the idea being to make the student thoroughly familiar with the forms and ornaments of all the historic styles. Having thus become conversant with the historical development of each style, and having tested its applicability to practical design, he may then accept, modify or ignore them in his later work, as he may see fit.

This system of studying each style separately from the design point of view is carried so far in Germany that, for their Gothic and Romanesque year, many students will visit a Hochschule where some professor who has made these styles his specialty has charge of the course, and for their Renaissance year will go to some other Hochschule where a master of that style holds his lectures.

The programme for the winter of the third year is as follows:

PLANNING OF DWELLINGS AND PUBLIC BUILDINGS.—(2 hours lecture.)

HISTORY OF RENAISSANCE ARCHITECTURE.—(2 hours lecture.)

DESIGNING AND DETAILING OF DWELLINGS.—(1 hours lecture; 5 hours drawing). Besides instruction in the designing of dwellings, this course includes the making of working drawings and full-sized details.

MEDIÆVAL ORNAMENT.—(2 hours' lecture: 2 hours' drawing.)

DESIGNING IN THE EARLY CHRISTIAN AND ROMANESQUE STYLES.—(3 hours' drawing.) This includes sketching and careful working-out of a problem from a given programme, also the making of perspectives from drawings and also from nature.

HISTORY OF GOTHIC ARCHITECTURE.—(3 hours' lecture.)

HISTORY OF RENAISSANCE AND MODERN ART.—(3 hours' lecture.)

ARRANGEMENT AND PLANNING OF BUILDINGS. — (2 hours' lecture: 3 hours' drawing.) This course considers the treatment of buildings of every class.

LANDSCAPE-DRAWING AND WATER-COLOURING. — (2 hours' drawing.)

LIFE CLASS.—(6 hours' drawing)

The only difference between the winter and summer terms is that during the winter the course of lectures on machinery takes the place of the 2 hours a week devoted to landscape-drawing and water-colouring.

Of the 35 hours a week of the fourth year's winter term 24 are devoted to design, so that the absence of design from the first two years of the course is made good to a certain extent in the last year. During this last year the following subjects are taken up:—

RENAISSANCE DESIGN.—(6 hours' drawing.)

MONUMENTAL BUILDINGS AND LAVING-OUT OF CITIES.—(1 hours' lecture: 4 hours' drawing.) In connection with this course a series of 5-hour sketch-problems is given out, subjected later to a comparative criticism.

HISTORY OF THE USEFUL AND DECORATIVE ARTS.—(2 hours' lecture.)

INTERIORS WITH COLOURED DECORATIONS.—(5 hours' drawing.)

DESIGNING OF PUBLIC BUILDINGS IN THE STYLES OF THE MIDDLE AGES.—(2 hours' lecture: 9 hours' drawing.)

LIGHTING, HEATING AND VENTILATION.—(3 hours' lecture.)

ELEMENTS OF ENGINE-BUILDING.—(3 hours' lecture.)

The student who has successfully completed this course is deemed ripe to begin his existence as an architect. To those who have passed the Government examinations, position and a future are assured. This brings one to the subject of examinations.

At the end of every term each student may take an examination in any subject in which he has registered. This is, however, entirely optional on the part of the students, and, as a rule, but few avail themselves of this privilege. For the students of architecture are no more prone than others to go to the trouble of preparing for an examination which is not obligatory and is not required for graduation. The real object of these examinations is to give those students who, for some reason, do not intend to take the regular prescribed examinations a chance to find out how much or how little they have learned during the term.

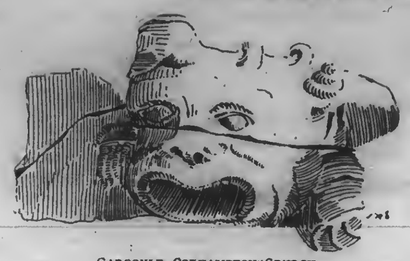
There are two distinct types of examinations, one the Staalsprufung, or Government examination, the other the Diplomprufung, or diploma examination. The subjects required are the same in both cases. The only difference between the two, as far as the examination itself is concerned, is that the one is held by an Examination Board appointed directly by the German Government, whereas the other is conducted by officers of the school. Whoever successfully passes the Government examination receives the title of Regierungs-baufuhrer, or "Government Director of Building," and can enter the Government service if he so wishes. As we have already seen, only those who have completed a nine years' course at a German gymnasium are entitled to take this examination. Naturally, all students who have fulfilled these requirements take the Government examination in preference to the other, if only for the sake of the title, even though they do not intend to enter the Government service. There are many of this class. For although the Government service offers a sure berth and a regular salary, and also a pension after retirement, the conditions are so unfavourable that but few are willing to undertake it.

The young Baufuhrer has to give the first year or year and a half of his services to the Government without receiving any remuneration whatever. Before becoming a Baumeister, the next rung of the Government ladder, an exceedingly difficult examination requiring a full year of preparation must be passed. The Baumeister receives a fairly good salary, and most who have reached this stage stick there till they are middle-aged men, when, if they are fortunate, they may be appointed Baurath. In spite of the fact that these unfavorable conditions have led to a great scarcity of Government architects, the German Government has till now refused to improve them, but will surely be forced to do so. Under existing circumstances, only those men who have not enough confidence in their own ability to hope for success in their battle with the world are apt to enter the Government service. This naturally leads to a deterioration of the work done for the Government and a change is sure to be made, and made soon.

The student who passes the other examination receives a diploma from the Hochschule to that effect. The purpose of these diplomas is to give the students who cannot take the Government examination an opportunity of proving that they have successfully completed the entire course in their special subject. The same subjects are required for the Government and diploma examinations.

A thesis design, for which two months are allowed, is required. Admission to the Final Examination depends on the acceptance or rejection of this design.

Most of these examinations are oral. In the mathematical subjects they are partly written, partly oral. Naturally, drawing plays a large part in them. The examination in each subject lasts either an hour or an hour and a half, and, usually, three students are examined at a time.



GARGOYLE, CORHAMPTON CHURCH.

PROPOSED TECHNICAL INSTITUTE FOR MONTREAL.

The Committee representing the educational institutions and various public bodies in Montreal appointed to enquire into the question of the establishment of a Technical Institute in that city has presented the following report:—

"Your Committee is of opinion that the time is ripe for the establishment in this city of a technical institute suitable to the needs of the people. Should the citizens be in earnest in the desire, which has been so frequently and widely expressed, for such provision as will enable the boys and girls, the young men and women, to have better facilities for securing an education along the lines indicated in the report submitted by the delegation which visited the States, your Committee has no hesitation in saying that such an institute could be erected, equipped and placed in working order, in a satisfactory manner without delay.

Such an institute should be built in sections, commencing with the departments for which there seems to be the most pressing need. In every case these sections should be built with a view of future extension. The work could then proceed so as to allow of expansion as funds become available.

Sec. 1. It is further recommended: That courses of instruction in mathematics, English, French, science, the elementary principles of mechanical and electrical engineering, and in mechanical drawing, etc., be commenced in September next.

Sec. 2. That as soon as practicable, steps be taken for the erection of a section devoted especially to technology, and of the general dimensions and character indicated in the accompanying rough sketches.

On the ground floor is located offices and a machine shop.

On the second floor is placed the wood-working shop, together with a suitable lecture room and other offices.

The third floor is sub-divided into laboratories for wood-carving, art metal work, etc.

The whole of the fourth floor is set aside for descriptive geometry and mechanical drawing.

In recommending a building of this type, for immediate erection your Committee is influenced by the fact that there is evidently a very wide demand for such courses of instruction as would then be possible. As a proof of this it may be stated that considerably more than $100,000 per annum is being paid to correspondence schools in the United States by mechanics in this city desirous of obtaining instruction in the elements of mechanical engineering, etc.

Sec. 3. The second main section of the institute, which your Committee considers of great importance, should be devoted to applied art and design and to domestic science. These branches could be provided for in a building of the same general dimensions as that devoted to technology.

The fourth floor of such building might be devoted to the domestic science department, including biology, the study of foods, cooking, dressmaking, millinery, needlework, art needlework and embroidery, together with the necessary lecture rooms.

On the third floor provision may be made for the freehand drawing, drawing from the model, modelling in clay, and drawing from life.

On the second floor provision may be made for applied art and design in its various branches, including drawing from the life, painting in water colors and in oils, the design and painting of fabrics, wall papers, book engravings, posters, etc., and all different kinds of art work.

On the ground floor are placed the administrative offices of the whole building, also a museum, library, etc.

Your Committee is of opinion that there is an increasing demand for instruction in art and design, and also in domestic science. This is proven by the fact that large numbers of young people of Montreal are obliged to leave the city to obtain the instruction in question, while the demand for classes in domestic science is far greater than can be met by present arrangements.

Again, as has been already pointed out, the great success of the Philadelphia Textile school has been largely due to the fact that it has been worked in connection with a school of art and applied design. Your Committee, therefore, considers that it is of the highest importance to all interested in textile industries, to note that in the proposed department of applied design they will have the fundamental provision which is so necessary to the complete success of textile work. Your Committee would suggest that the textile department be erected, with a school of art and applied design, as shown on sketch. The general equipment and arrangement of these must be decided upon by authorities on textile work, of whom we have many able expositors on our Committees.

TRADE DEPARTMENTS.

Sec. 4. Next in order, and, in the opinion of your Committee, of great importance, is the proper establishment of suitable departments for the various trades, carpentry, plumbing, bricklaying, stone cutting, galvanized iron work, blacksmithing, fresco work, house painting, wiring, etc. There is undoubtedly a very large demand for courses of instruction in these departments, and this work should be commenced as soon as possible.

Your Committee is of opinion that steps should be immediately taken to provide, by correspondence, such courses of instruction as may meet the demand of those in this country who are too far from the city to take advantage of the special courses to be provided in the proposed technical institute.

Your Committee recommends that other departments be added from time to time as the demand may justify.

Your Committee would conclude this report by expressing the opinion that all students of the Institute should be required to pay fees. It is recommended that the fees for the evening classes be much less than for the day classes, and that the charges for the former be moderate. All the investigations of the Committee go to show that the best results have been obtained in those Institutes where fees are levied, as the students themselves prefer the feeling of independence which they naturally possess with the knowledge that they are paying for the instruction they obtain."

FOLDING.

We have the folding bed,
The folding bath-tub, too,
And folding chairs, its said,
Are nothing very new.

Some hat-racks shut up tight
In most ingenious way;
A couch for use by night,
A Sofa by day.

The folding table's found
Wherever man may roam,
And folding doors abound
In every modern home.

But one thing now we need,
And soon we will have that,
For in brief time, indeed,
There'll be a folding flat.

The Department of Buildings at New York has been conducting a series of tests to discover leakage of illuminating gas in many of the prominent theatres and hotels and Dr. Lloyd, of that city, has been making similar tests in dwelling-houses. The latter experiments had reference to the condition of certain patients who exhibited symptoms bearing close resemblance to those noted in typhoid or malaria, without manifesting the usual stigma of those diseases. As a result Dr. Lloyd found present in the rooms of these patients sufficient quantities of carbon monoxide, one of the constituents of illuminating gas and of sewer gas, to account for the symptoms noted. The device used to ascertain the presence of gas when it could not be detected by the sense of smell was one which brought the air supposed to be contaminated with gas into contact with a strip of paper sensitized. When the gas is present this becomes discoloured, and the depth of discolouration, ranging from rose pink to black, indicates approximately the percentage of gas in the air.

—THE—

CANADIAN ARCHITECT AND BUILDER

A Monthly Journal of Modern Constructive Methods,

(With a Weekly Intermediate Edition—The CANADIAN CONTRACT RECORD).

PUBLISHED ON THE THIRD WEDNESDAY IN EACH MONTH IN THE INTEREST OF

ARCHITECTS, CIVIL AND SANITARY ENGINEERS, PLUMBERS DECORATORS, BUILDERS, CONTRACTORS, MANUFACTURERS OF AND DEALERS IN BUILDING MATERIALS AND APPLIANCES.

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ADVERTISEMENTS.

Prices for advertisements sent promptly on application. Orders for advertisements should reach the office of publication not later than the 12th, and change of advertisements not later than the 5th day of the month.

EDITOR'S ANNOUNCEMENTS.

Contributions of value to the persons in whose interest this journal is published are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

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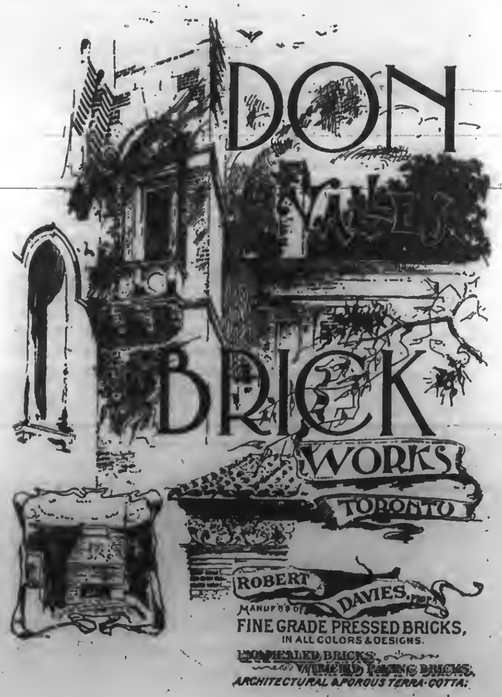
NOTE.

Mr. Vincent Groom, of Llanrug, Wales, is said to have solved the problem of the disposal of the refuse of slate quarries by perfecting a process by which, it is claimed, the waste can be made into solid blocks, capable of taking a highly-glazed surface in any number of colours. It is claimed that the new substance thus produced will stand a pressure of 100 tons to the inch—more than any natural stone—that it will be lighter in weight, and can be placed on the market at a cheaper rate than ordinary tiles.



NOTES.

A writer who has demonstrated the fact says that 3 pecks of lime and 4 bushels of sand are required to each perch of 22 cubic feet of masonry when built in a wall.

The belfry of the fine old cathedral at Chartres has been found to be in a defective condition. By the winds of centuries and the vibration of the bells the masonry has become dangerously insecure. Repairs are to be promptly made.

In connection with a recent discussion before the Boston Society of Civil Engineers on Foundations Mr. E. W. Howe mentioned a novel method of driving inclined piles in foundations for the Atlantic Avenue bridge by the aid of a steel case 13 inches square and 39 feet long placed at the desired inclination. With this apparatus 95 piles were driven in 10 hours. Mr. R. A. Hale mentioned a chimney 225 feet in height imposing a load of 2,250 tons on an area of 1,225 square feet, the foundation being sharp river sand 19 feet below the surface of the ground, into which piles had been driven to a depth of 5 feet; allowing for wind the extreme pressure is 2.4 tons per square foot and no settlement has occurred.

The United States Fidelity and Guaranty Company, one of the largest, strongest and most favorably known surety companies on this continent with a cash capital and surplus of over three million dollars have established their Canadian head office in Toronto at 6 Colborne st. The joint managers are Mr. Arthur E. Kirkpatrick, one of Toronto's most enterprising young business men, and Mr. J. A. Kennard, late of Baltimore, a lawyer of experience and ability. The bonds of this Company are accepted by the Canadian Governments, municipalities and by railroads and corporations in all cases where a bond guaranteeing the specific performance of a contract is required. They are prepared to furnish bonds at once up to any amount.

It has always been a wonder to us why architects should be so fond of the blocked column, for to our mind it is an ugly feature. It has neither the solidity of the pier nor the grace of the column, and always produces a lumpy effect. The lines of the column are quite spoiled by the clumsy-looking blocks, strung like so many chunks on a rod. We can call to mind a score of buildings which are marred by this feature. Without doubt it has been used by architects of great eminence, but that does not change its inherent defects. And not only is it ugly, but the additional cost of the stone is considerable. We should like to see it altogether abandoned, and, in place, either a solid-looking pier or a column with its graceful lines uninterrupted from base to cap. But we fear the blocked column is being increasingly used rather than set aside, probably more for ill-considered fashion than deliberate choice. Ill-considered fashion is not a thing to foster.—Building News.

The most artistic and durable color effects on shingles are produced with Shingletint, which is a scientific combination of linseed oil, coloring matter, creosote, and the necessary drying agents.

Among the many shingles stains offered Shingletint is conspicuous not only for its superiority but because it can be called for by its distinctive name, thus offering the consumer protection against inferior goods offered for the same purpose.

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POROUS TERRA COTTA among underwriters is classed as preferred risk, and the schedule of rates now enforced in the city of New York shows a difference, often great, which, computed means an annuity on large sums of money.

This indisputable fact appeals to architects as representing clients who may soon be exposed to the same classification in Canada. An apparent saving in selecting cheaper fireproof material may be more than lost through increased insurance cost.

POROUS TERRA COTTA FIREPROOFING is a credit to the buildings in which it is used and increases their selling value.

The **Montreal Terra Cotta Lumber Company,** Limited,

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O. A. A. EXAMINATIONS.

The Examinations of the Ontario Association of Architects were held in April. The following were the successful candidates:

1st Examination.—Messrs. W. F. Sparling, L. C. Montizambert and Edwin Menger.

2nd Examination.—Mr. J. A. Mackenzie.

PAINTERS' AND DECORATORS' CONVENTION IN TORONTO.

At the Ninteenth Annual Convention of the National Association of Master House Painters and Decorators of the United States and Canada, held in Richmond, Va., in Eebruary last, a cordial invitation was given the Association by Messrs. Jas. J. O'Hearn and Stewart N. Hughes, President and Secretary of the Toronto Association, to hold its convention of 1904 in Canada's Queen City. The invitation was backed by a letter from the Mayor of Toronto, and was accepted. Mr. Hughes was elected a member of the Executive Committee.

TESTS OF MATERIALS.

The care exercised in Germany to demonstrate the qualities of materials employed in construction, is illustrated by a recently published report of the operations of the Imperial testing station at Charlottenburg. During the year in question 32,580 tests were made, against 31,982 tests in the preceding year. Some of these were carried out at the request of foreigners. Of the 1901 tests 20,391 were of binding material; 12,189 of various kinds of stone. Armed cement was especially dealt with. But many tests were made with trass-lime mortar. There was a considerable increase in the number of samples of lime sandstone, showing that this is coming into use. Another notable feature of the tests was the number of samples of jointless flooring in imitation of linoleum and woodword. For this purpose for the first time the sandblast has been employed in producing patterns on these materials. A committee appointed by the Minister of Public Works and for Trade and Commerce was charged with the testing of gypsum; samples are being obtained from abroad as well as at home.

FIXING TILES.

The general custom nowadays, says the Builders' Record, seems to be to use copper nails for fixing tiles or stone slates, that is, in work where some little pretention is made to doing the thing well. Of course a speculative builder uses the cheapest thing he can get hold of so long as it lasts long enough for him to sell the house, and he may use iron nails unprotected or perhaps coated with tar. If he adopts galvanized iron nails he no doubt considers he is doing the thing handsomely. But let the conscientious architect avoid being misled into them by the persuasive builder. Zinc or composition nails are better—but not good enough. Wooden pegs seem to have gone out, but they were fully as good as iron nails. In some ancient buildings the tiles were fixed with splinters of bone, and excellent they were for the purpose. And now another instance has recently been offered by a writer in the daily press of an old building at Mansfield which was a good many years ago roofed with stone slates fastened with hundreds of the prongs or tynes of the antlers of deer. They were pegged into holes pierced in the slabs—two to each slate—in the ordinary way. Their use was evidently traceable to the ancient builder's desire for quaintness. It is these little tricks and fancies of the old workmen which more often than not give the quaintness and charm to old country houses so much admired by all our architectural students. All the striving after effect so characteristic of to-day does not make up for the interest we derive from the evidences of the loving hand and thoughtfulness and resource of the craftsmen of old.

Cassidy—Oi want a wreath av flowers, an' put on it, "He rests in pieces." Florist—Don't you mean "He rests in peace?" Cassidy—Oi mane phwat Oi sed. 'Tis fur Casey, thot was blowed up in the quarry.—"Tit-Bits."

We are in a position to supply
ARCHITECTS, BUILDERS, CONTRACTORS AND CARPENTERS
—WITH—
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New Process of ARTIFICIAL MARBLE
(In Keen's English Cement.)

I wish to lay before the public notice that I am now manufacturing Artificial Marble and that I have to that effect secured the services of Mr. Geo. F. Simpkin, who has had over 12 years experience with the leading firms of this special work in the United States and England. I am now prepared to undertake the manufacture of Artificial Marble Columns, Church Altars, Shrines, Bases, Capitals, Pilasters, (plain or fluted), Decorative Mantels, Dadoes, Pedestals, Etc. Samples of this work can be seen at my office or factory, 304 and 308 St. Joseph St., St. Roch, Quebec City, and at the Hochelaga Bank, M. S. Foley's Bellevue Apartments, Metcalf St., H. Morgan & Co., and Art Rooms, Philips Sq., Montreal.

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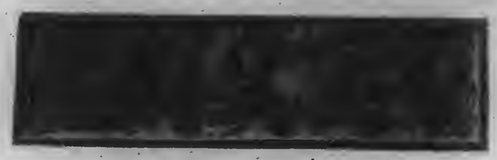
Makes a specialty of issuing contract bonds. A business proposition. Responsible contractors should use us and avoid putting themselves under personal obligations. Consult our local representative.

Jarvis Concrete Block Machine Company

McKinnon Building Toronto Canada



ROCK FACE BLOCK [Patent Pending.]

DUCK BILL TOOLING [Patent Pending.]

CROSS TOOTH CHISELED [Patent Pending.]

TOOLED FACE BLOCK [Patent Pending.]

These are facings that the Jarvis Machine will cast, besides three other rock faces not shown here.

This is the Concrete Era. Concrete made of Portland Cement, sand &c., is fast superseding natural stone, as well as brick and steel for buildings, and all kinds of constructions, such as bridges, dams and foundations of every description.

In view of the foregoing facts a Company has been formed for the purpose of manufacturing machines of all descriptions, for the making of concrete constructions.

This Company has acquired from Beaumont Jarvis, Architect, of Toronto, Canada, several of his inventions and patents, relating to machines for forming concrete walls, and concrete facing stones for buildings.

The science and art of manufacturing concrete building stones has advanced with leaps and bounds, so that with any of our machines in one simple operation, durability, beauty, economy, and sanitation together with insulation from heat, cold, damp, or sound, is absolutely effected since a hollow wall is perfect proof against heat or cold, and concrete is stronger than brick and more durable than most natural stones; any prominent Engineer will verify that.

For a few hundred dollars any one may equip a plant with these machines which will absolutely dispense with the manufacture of brick buildings, having the appearance of natural stone, at about the same cost as brick.

One block has the same cubic capacity as about forty bricks, so that it must necessarily cost so much less for the laying of our hollow blocks per cubic foot than for brick. Then again, the walls being hollow, the building must necessarily be lighter and stronger because concrete is stronger than brick and the hollow space makes the wall lighter than a solid wall.

We have in our employ an architect, engineer and artist. Without these no artificial stone or concrete stone company can have any great success and those who buy our machines will have full instructions, and the benefit of their knowledge as to manipulation. We also employ none but the very best machinists and foundry men, and skilled mechanics in every branch.

For fifty years concrete stone has been used in England for the facing of many important buildings and stands to-day, without any apparent weathering.

At the present time in France many important buildings have been faced with concrete stone and also many cities throughout the United States and Canada.

JARVIS MACHINE SHOWING MOULDED HOLLOW BLOCK
[Patent Pending.]

This hollow block is a registered design, and was invented by a practical architect, Mr. Beaumont Jarvis, of Toronto, Can. The object of this invention is to make a stone facing to a wall, having a hollow space, which is a non-conductor of heat, cold, or sound. The advantage of the hollow cement blocks made by the Jarvis Concrete Block machine, as compared to other blocks is in the fact that it only requires one half the time and labor to manipulate the machines than any other on the market. The new machine is more simple, and one half the expense of any other.

We supply with each machine six plates, so that the stone cast by the Jarvis Concrete Block Machine may have any tooling or rock face that may be required, the same as the natural stone. The size of the stone is 8" x 8½" x 24" 6", or in case of hollow blocks the size is 8½"x10"x30". Three men doing their own mixing without any other machinery, can make from 100 to 150 blocks per day, which is equal to 250 to 350 feet.

The above block is a registered design, and any one infringing on this will be prosecuted, and a reward will be given to anyone for information that will lead to the conviction of any person or persons infringing on the said invention.

These blocks can be manufactured at about 11 cents per foot, and sills and heads should not necessarily cost any more.

Most natural stone costs from sixty-five to eighty-five cents per foot. Is it any wonder these blocks are bounding into popular favor?

The Jarvis Concrete Block Machine Company is also prepared to undertake all kinds of concrete construction such as dams, bridges, and foundations of all descriptions.

The Portland Cement industry throughout the world is developing to stupendous proportions and has superseded natural stone in addition to wood and steel.

A properly made concrete stone should have all the appearance of natural stone, and every engineer is aware that concrete is everlasting.

The Pantheon, at Rome, has a concrete dome of 142 ft. in diameter and has weathered the storms and other destructive influences for nearly two thousand years and is to-day, apparently, in as good a condition as the day it was built.

In England, where natural stone was used for facing and concrete for the backing, the natural stone has crumbled away and the concrete backing, which was intended to play the secondary part is better than ever.

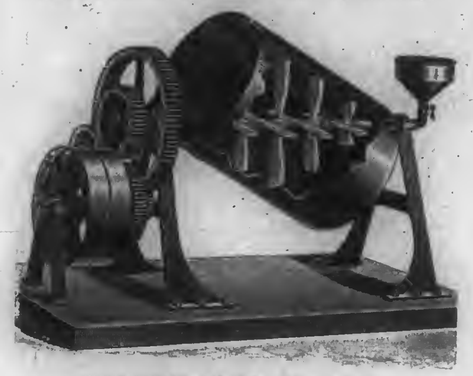
JARVIS CONCRETE BLOCK MACHINE COMPANY - McKINNON BUILDING, TORONTO, CANADA

Jarvis Concrete Block Machine

PATENT APPLIED FOR

JARVIS SILL MACHINE READY FOR USE. [Patent Pending.]

MACHINE OPENED SHOWING CAST WINDOW SILL [Patent Pending.]



JARVIS CONCRETE MIXER. [Patent Pending.]

JARVIS SILL MACHINE OPEN [Patent Pending.]

Concrete Mixer

This is the best Concrete mixer known. Each revolution without the aid of the blades inside will turn over the mix four times in the opposite direction to one turn the drum, should make it equal to about 16 turnovers at one revolution of the drum.

The only way to get a good concrete is to have the proper proportions of cement and sand &c. well mixed—men with shovels are not always reliable, and most mixers on the market are still more unreliable than the men. The mixer may be run by hand or motor power.

The axle of the machine is hollow and perforated, so that the water is sprayed gradually into the mix—any other method does not give the best results.

A FEW INTERESTING POINTS

It is only a drum having the axle going diagonally through and having blades revolving in opposite directions.

A gentle spray is gradually sprinkled through the mix by pouring the required number of pails into the hopper.

There is nothing to break off the blocks as in some mixers.

It is the most efficient and up to date mixer, doing the quickest work of any on the market.

There is nothing complicated about it.

Jarvis Concrete Wall Mould

is an invention for the forming of concrete walls for foundations, also bridge piers, dams, &c., &c.

The usual way of building Concrete walls by using scantling and boards is very crude and expensive and also difficult to get straight and plumb.

By this method and device the mould box is moved along the wall thereby actually casting individual stone of any breadth, length, width, or depth in position in the wall.

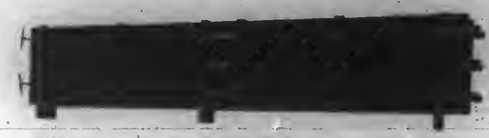
This ingenious device telescopes in every direction and may be 16 feet long if necessary.

In three days the next layers of stone or concrete may be cast so that if your mould box is 3 feet deep it means only twenty days to build a wall 20 feet high.

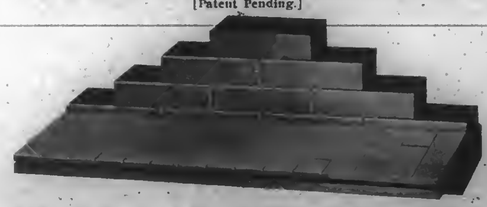
The size of the building does not signify as it only means more moulds and more gangs of men.

Further particulars will be sent to the purchaser with each machine.

JARVIS CONCRETE BLOCK MACHINE COMPANY



JARVIS MOULDING FORMS FOR MONOLITHIC CONSTRUCTION
[Patent Pending.]



JARVIS METHOD OF CONSTRUCTING FOUNDATIONS AND BASEMENT FLOORS.
[Patent Pending.]

It can be seen from the above cut that walls and floors formed in this way are absolutely non-conductors of heat, cold, damp and sound. There are 3 air spaces in the walls. Walls of this construction will cost less than brick.

If a whole house were built in this way a great saving of fuel would be the result.

The Jarvis Concrete Block Machine Co. is prepared to arrange with parties to sell district rights, and is also prepared to appoint agents in various districts, who will be allowed a liberal commission for any sales they make.

THE JARVIS TELESCOPE MOULD BOX

This mould box is a telescoping arrangement, so that a stone of any length, breadth, depth or height may be cast. It is also applicable for moulded sills courses or any moulded course by simply dropping down in the bottom of the box a reverse wood mould of what the stone casting is to be. This is probably one of the most ingenious devices ever invented for the concrete stone industry and bids fair to revolutionize all other forms of moulds for casting stone.

JARVIS CONCRETE BLOCK MACHINE COMPANY - McKINNON BUILDING, TORONTO, CANADA

SAINT MARY'S CHURCH, PARISH HOUSE AND RECTORY, WALKERVILLE, ONT.

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SUPPLEMENT TO
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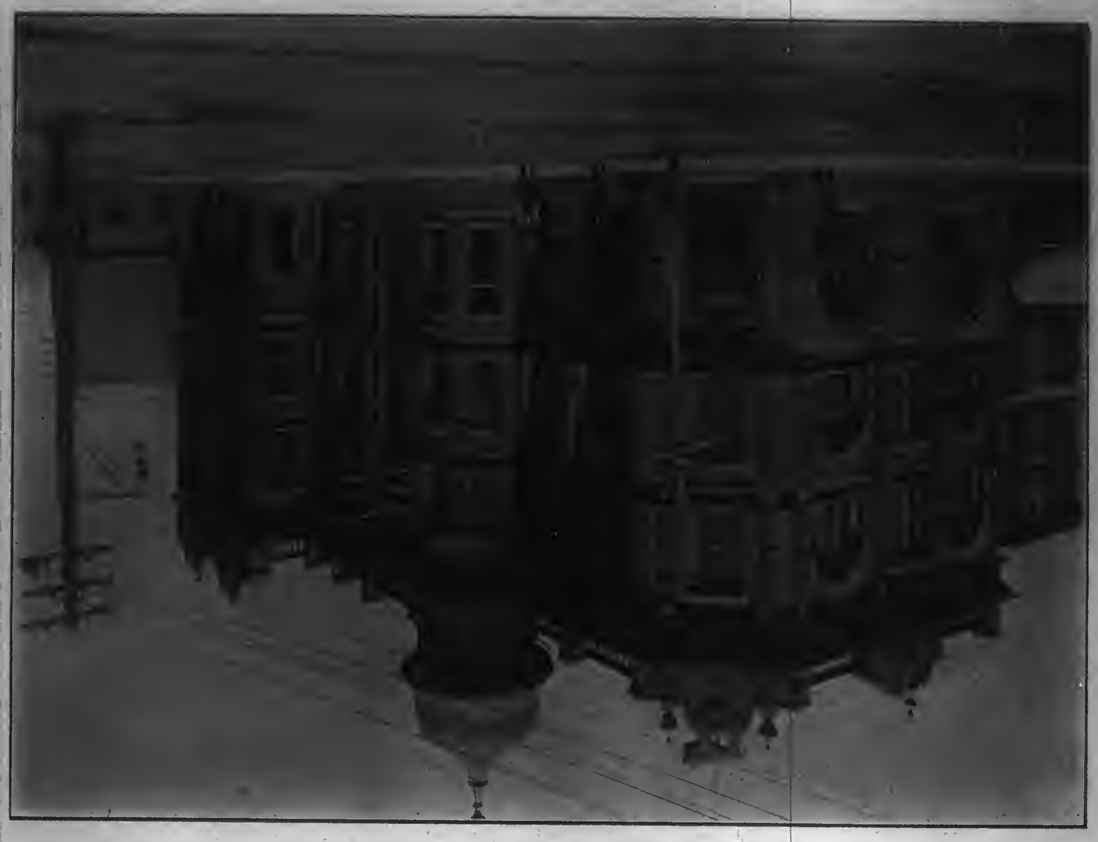
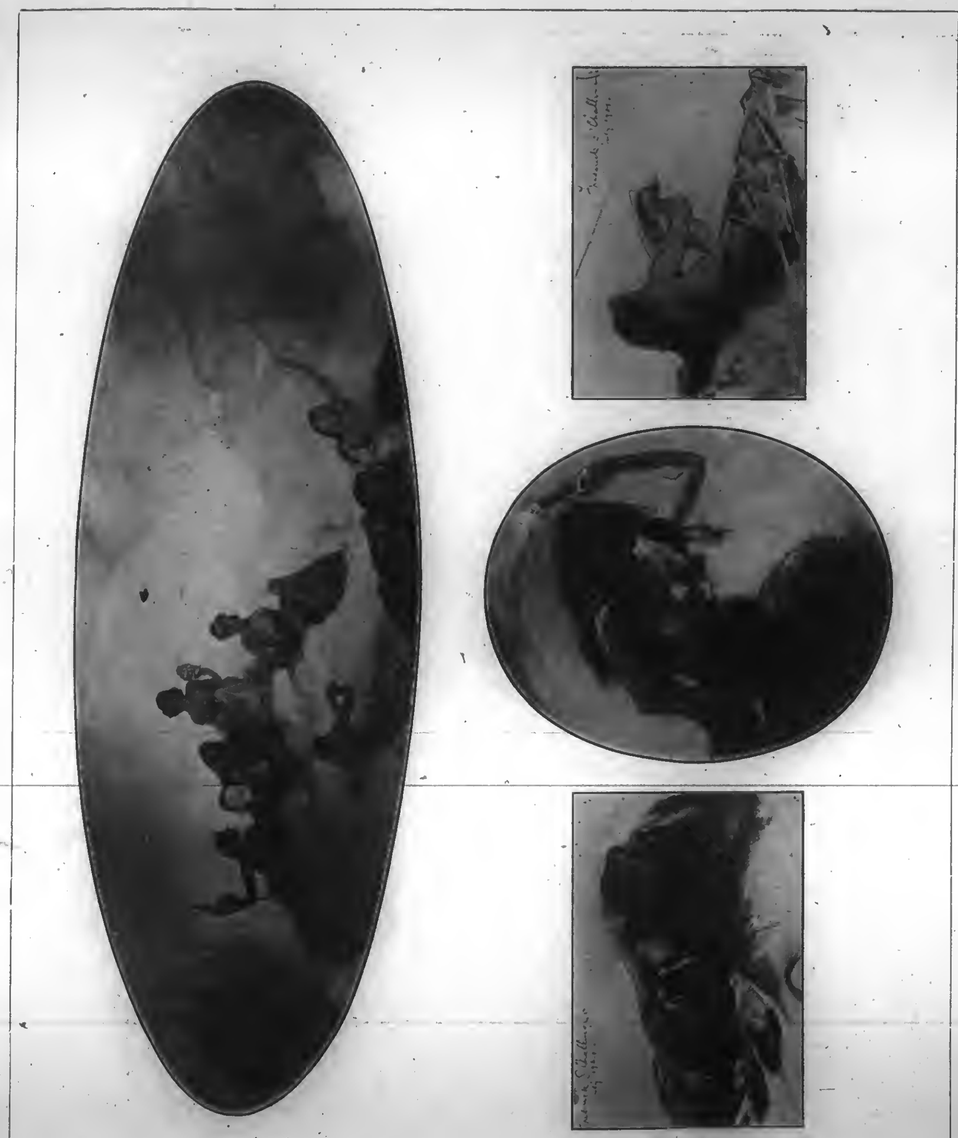


ROYAL BANK OF CANADA, SYDNEY, NOVA SCOTIA.
J. C. DUMARESQ & SON, ARCHITECTS.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
MAY, 1903

THE ALLEN HOMESTEAD, MOSS PARK, TORONTO.
IN PROCESS OF DEMOLITION.



THE TRIUMPH OF THE DRAMA.

DECORATIVE PAINTING FOR CENTRE PANEL OF PROSCENIUM ARCH, RUSSELL OPERA HOUSE, OTTAWA.

BY FREDERICK S. CHALLENER, R.C.A.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
MAY, 1908

The Canadian Architect and Builder

VOL. XVI.—No. 186. JUNE, 1903.

ILLUSTRATIONS ON SHEETS.

House in Crescent Road, Toronto.—S. H. Townsend, Architect.
Exterior and Interior Views of House in Roxborough Street East.—Chadwick & Beckett, Architects.
An Interior—The Ceiling in a Single Tone of Old Plaster Color; the Frieze an Original Mural Painting in Oil; Wood-work, Dark Weathered Oak.—Decorations by W. H. Elliott & Son Co., Toronto.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Four views showing Interior of Board Room and Offices of Canada Permanent and Western Mortgage Corporation, Toronto, Frank Darling and R. J. Edwards, Associate Architects.

ILLUSTRATIONS IN TEXT.

Views and Plans of a London House and its Surroundings.

CONTENTS

Editorial	95-96	Size of Windows in Relation to Floor Space	104
Employment Wanted by British Building Mechanics	96	Architectural Competitions in British Columbia	105
Errata	96	Legal	105
Notes of Travel.—I	97-98	Notes	105
Relative Cost of Doing Work in Winter and Summer	99-100-101	Test of a Cast-Iron Heating Surface in Connection with a Fan System of Heating	106
Practice	102	Demand for Roofing Slates	107
Perfect Planning	103	By the Way	107
The Qualifications for an Architect	103	An Architectural Alphabet	109
Sketching in Charcoal	104	A Fifteen Storey Concrete Building	110
Professional Charges	104		

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" J. C. B. HORWOOD, Architect, Toronto.
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Canadian Building Materials for Japan.

The Hon. Sydney Fisher, who has recently returned from a visit to Japan in connection with the exhibit which Canada is to have at the Osaka Exhibition, states that a market exists there for various lines of Canadian products natural and manufactured. These include lumber, furniture and sheet metal building material. The Japanese Minister of Education was greatly impressed with the adaptability to school building of the metal roofing and ceiling material forming part of the Canadian exhibit, and promised to send one of his architects to inspect it.

Brick Tests.

The result of a series of tests made to determine the weak points of bricks under different conditions, was recently presented to the American Society of Civil Engineers in the form of a paper containing numerous tables and illustrated by photographs and diagrams. Tests were made for compression, tension, bending shear and torsion, the following being shown to be the order of increase in strength: Tension, shear, torsion bending compression. Further the tests showed that water does not cause deterioration in strength, while reheating greatly improves the quality.

Effect of Climatic Conditions on Cost of Building.

The opinions of more than twenty-five representative Canadian architects and contractors as to the relative advantages and economy of finishing buildings in winter and summer, are printed in the present number. The subject is considered from every point of view. The letters make interesting and instructive reading, and should help to settle in the minds of building owners, architects and contractors, an important question on which there has hitherto been wide divergence of opinion. The consensus of opinion expressed by our correspondents is strongly in favor of the advantage of summer work. Many good and apparently sufficient reasons are given in support of this view, although the minority who hold to the opposite belief, are not without reasons to support their position. There are many questions of perhaps equal importance on which a comparison of experiences would be profitable.

Fireproofing That is Not Fireproof.

The destruction of the Roosevelt Building in New York teaches that it is useless to spend money in fireproofing buildings unless every detail of the work is thoroughly done. This building was supposed to be

fireproof. The floors were of steel beams and terra cotta arches, the flanges protected and the space above the arches filled in with concrete. It had a tile roof. But, one of the elevator shafts was unprotected, the columns supporting the different floors were of cast iron, unprotected, and there were numerous partitions glazed in the upper portion with ordinary glass. These caused the destruction of the building. The fire shot up the elevator shaft, the unprotected cast iron columns and glass partitions cracked and gave way, letting down the roof and upper floors, which in falling broke through the lower floors. Fireproofing done in this manner is not only a waste of money but the destruction of the buildings thus carelessly constructed has weakened the confidence of the underwriters and the public in the possibility of making buildings fireproof.

Strikes in the Building Trades.

The Engineering Review hits the nail on the head when it says: "The building trades seem to have rooted objection to work. At least, history shows that whenever there seems to be an excellent chance for them and their employers to make some money they, more than any other class of working men, make demands which tend to restrict building operations and throw themselves, or many of themselves, out of work." The truth of this statement was never more forcibly illustrated than this year, when the prospects for an unusually prosperous season have been to a large extent blighted by strikes. It is a pity that the wisdom of the axiom "make hay while the sun shines," is so foolishly disregarded by the workman of to-day. When the summer is ended and the coal bin needs replemishing it will perhaps begin to dawn upon the strikers that they would have been better off had they worked steadily all the year at a few cents an hour below what they demanded and were refused. Labor, unlike many other commodites, cannot be stored away and sold, perhaps at a greater profit, at a later date. The workman who refuses to sell his labor to-day is out of pocket for all time the money he might have obtained for it.

Peculiarities of Bricks Composing the Campanile.

Some interesting data, gathered from careful examination of the bricks used in the construction of the fallen Campanile at Venice, is said to have been presented in a recent lecture by Commendatore Boni to the History Congress at Rome. The lecture was illustrated by drawings. The bricks are said to have been manufactured in the first century, not from kneaded and compressed clay, as at the present day, but from slices of the natural clay. On this account each individual brick is believed to have a supporting strength four times as great as the bricks of to-day. The lecturer exhibited specimens of bricks which he had had made out of Roman clay in the same manner as the ancient ones, with the object of showing that the new Campanile might be built of the same enduring material as the old. Some of the ancient bricks are curiously marked with figures, numbers, private marks and letters. Signor Boni infers from their shape, texture and general appearance that they were made not by the Venetians, but by the Romans, and prior to being built into the Campanile had been used in fortifications and other forms of construction.

The Duty of Committees of Award.

Messrs. G. F. Bodley, R.A., and R. Norman Shaw, R.A., assessors in the Liverpool Cathedral Competition, have presented their report. They give first position to the design by Mr. Gilbert Scott, grandson of Sir Gilbert Scott. The Builder states that Mr. Scott's design entirely ignored an important condition set forth in the instructions to the competitors, viz., that the plan of the cathedral should provide for a wide open space for a large congregation within hearing of the preacher. It is probably for this reason that the Committee have expressed their intention not to accept any of the designs. We were surprised not long since to hear several architects engaged in conversation about competitions, state that it was their practice when preparing plans for a competition to ignore the limit of cost set for the proposed building. It is manifestly unjust to the competitor who honestly strives to strictly conform to all the conditions laid down, and who perhaps is hampered because of his conscientiousness in this regard, that his design should be passed over in favor of the man who sets himself to produce something which will catch the fancy of the assessors, regardless of the conditions.

ERRATA.

Through oversight the name of Mr. Frank Darling does not appear on the illustration sheets in this number showing views of the interior of the Canada Permanent and Western Mortgage Company's Offices and Board Room, Toronto. Mr. Edwards writes that Mr. Darling and himself were joint architects in the planning of these improvements.

EMPLOYMENT WANTED BY BRITISH BUILDING MECHANICS.

538 Oxford St., London, W., England.
May 31st, 1903.

To the Editor of the CANADIAN ARCHITECT AND BUILDER.

Sir,—Hearing that men are wanted in the building trades in Canada, may I suggest to you the formation of a similar society to the "Canadian Farmers Help Society." There are many men of good experience with references as to their workmanship and reliability who are quite unable to get good permanent work here in London. The work that is offered is so desultory and has no permanence except in a minority of cases. Taking myself as an example, I have had three and a half months work this year, and although I have worked to my employers' satisfaction and have good references, I am quite dependant on taking my chance with two or three hundred other applicants for the very few berths on offer here in England. Should you consider this any further or care to throw your columns open to a few advertisements from men in London wanting work in Canada, I feel sure that there would be many hundreds of men to avail themselves of your kindness. Thanking you in anticipation.

I am Sirs
Yours sincerely,
ROBERT H. BAKER.

[There is at present a brisk demand in Canada for building mechanics, as well as mechanics of all kinds, but the trade unions are demanding higher wages and shorter hours, and are strongly objecting to mechanics being brought in from Great Britain. There is no doubt, however, that competent workmen coming here at the present time would be certain to find employment at fair wages. We hope that some of the workmen who find it difficult to obtain regular employment in London, may find their way to Canada. If they are competent and sober, they can rely upon getting employment.—EDITOR, C. A. & B.]

NOTES OF TRAVEL.—I.

A LONDON HOUSE AND ITS SURROUNDINGS.

The accompanying plan shows a typical west end house of the smaller size in a good neighborhood.

VIEW OF FRONT OF HOUSE.

The plan itself is interesting, and to my mind shows a true elegance obtained by dispensing with certain conditions which are usually, in Ontario at any rate, considered to be indispensable in the plan of a first-class house. In the first instance the single flight of stairs will attract attention. It is considered, with us, a matter of the first importance that every house, no matter how small, that pretends, though a cottage, to

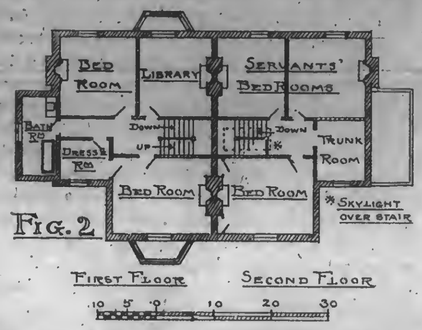


FIG. 2.

be "a cottage of gentility," should have a back stair.

The greatest pains can not prevent this stair injuring the simplicity of the ground floor, and thereby adding to the cost to an extent that does not appear in the cubical contents of the staircase itself; and unless sufficient space is taken to disconnect it from the kitchen it is a sure means of conveying the smell of cooking from the kitchen to the rest of the house. The gains on the other side are that servants will not be encountered on the stair from ground to first floor, which is the extent of the back stair in this sort of house, and that the stair carpet on this stair lasts longer. The latter point must be yielded; but, if the stair is well placed—as it is in the example here given—the passage of servants is no real trouble. In the old days, when slops had to come downstairs to be carried out of the house, the back stairs had a reason for existence even in small houses; but now-a-days there is no actual traffic on the main stair during the day. It affords a means of access to the housemaid's up-stairs work; that is all. As far as the approach to the servants' bedrooms goes, it is generally conceded that this should merge in the family lines of communication for some part of its way, and that communication with the kitchen should not be too easy. It seems therefore as if too much can be made of the desirability of a back stair, and that a retired arrangement of the main stair, something after the manner of the stair in this plan, might be substituted with advantage for small houses.

The principal reason however, why the ground floor, in the plan before us, is so simple is that it has no service rooms. It would be undoubtedly better, for easy service, and the care of glass and china, to move the lavatory back and the entrance and dining room to the right and slip in a service pantry entered from a sort of back hall, formed under the stair landing by moving the door at the head of the stairs to the face of the landing at the return. But how this spoils the hall, complicates the plumbing and makes tight work of the entrance and area steps, taking from

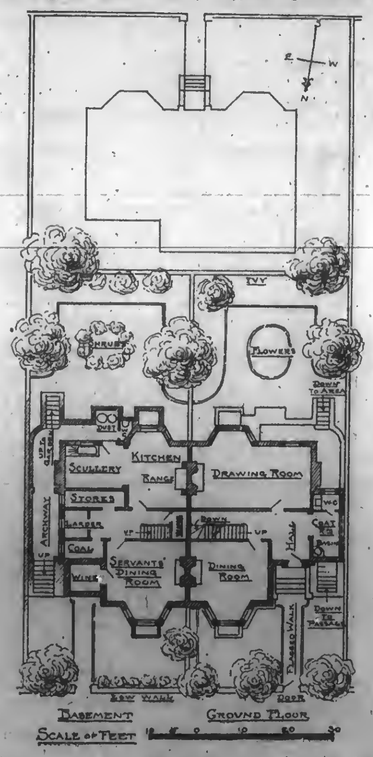


FIG. 1

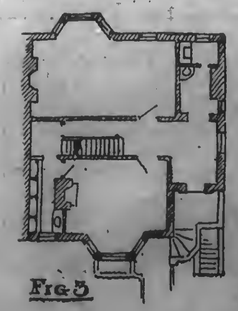
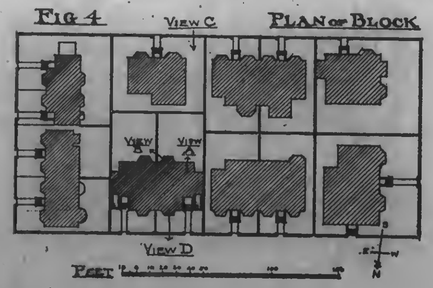


FIG. 3

them their present dignity! There is however no doubt that the ground floor service room should be managed somehow. It is quite otherwise with the kitchen; the beauty, not only of this house, but of the whole neighbourhood, lies in the basement kitchen; and here is the point best worth considering about the London house. With us it is considered a matter of necessity, for the sake of easy service, to have the kitchen department on the same floor as the living rooms and the front door; but how much we suffer in consequence! The service rooms are pinched to the last degree yet without preventing the living rooms from being pinched too. The kitchen must, except on a prohibitive scale of cost for land, share the best floor with the best rooms; intrude a perceptible presence among them; and condition their arrangement and lighting. In other words the family suffer in order to give advantage to the servants. What is this advantage? It is not an all around advantage. Cramped quarters are no gain to the servants, nor are they any happier for being so close to the living rooms. It is chiefly for convenient communication with the dining room and the front door that the kitchen department is placed on the ground floor; and the insertion on the ground floor of a serving pantry, with a sink and with cupboards for china and glass, fairly meets this necessity; for the maid, whose duty it is to attend to the front door during most of the day, will have her special quarters in this pantry. If ease of service for the dining room and front door is met in this way, the balance of advantage seems to be in favor of a basement kitchen, merely from the servants' point of view; for there will be ample quarters, isolated and distinct, and comfortable in summer as well as in winter. We are apt to think of a basement as a damp and dreary place; and so they are in houses where the basement is not used, and is not built for use; but these high, airy and dry English basements are quite another thing, and indeed it is more sanitary for the rest of the house that the cellar should be kept warm and dry by being occupied. But the great gain is in point of beauty and cost; larger rooms on the ground floor for the same money, and every room with a free look out.

It is in the matter of look out that the London house is such a useful study of how to make the most of a town lot. It is not an individual work; all the houses in the block must be planned with the same idea: If the custom is not already established it is a case for building restrictions; and in the borough of Kensington, where the house before us is situated, the law comes in also forbidding the drying of clothes in gardens. The result is a block of buildings as in Fig 4.

The kitchens are all invisible and there are no back yards—except in the American sense of ornamental ground. Ashes and rubbish are placed in two large cans which have a place of their own, outside in the kitchen area of every house, where they are concealed from view, but readily accessible to the dustman on his rounds. Rag and bottle men and all kinds of waste



users also thrive in London. The result is a clear area, on both sides of the house, which is devoted to trees, shrubs and flowers in borders, and either paved or tamped hard with London red earth mixed with gravel. The street fence is a low wall, usually of brick plain or stuccoed and painted like the house. The divisions inside the lot are often of inconspicuous iron. Sometimes there is a stone or terra cotta balustrade on top. An interesting feature is the gate which rises up between posts, no matter how low the wall is, and is

FIG. 5.—VIEW FROM DRAWING ROOM WINDOW.

more often than not a solid door. Sometimes this door is kept shut and can be opened from the house when the bell is rung. The bell pulls are usually in any case in the gate post, in beautifully kept brass; there are a pair,

FIG. 6.—FROM DRAWING ROOM BAY WINDOW.

one labelled "visitors" and one "tradesmen" so that the servant within knows whether to go to the door upstairs or downstairs.

W. A. LANGTON.

RELATIVE COST OF DOING WORK IN WINTER AND SUMMER.

A difference of opinion seems to exist among architects and builders as to whether the inside work on a building can be done more cheaply in winter than in summer, and whether a contractor is justified in submitting lower tenders for such work to be done in winter. The arguments pro and con will be found in the following letters recently received from representative architects and contractors throughout Canada:

TORONTO, April 29th, 1903.

I consider the contractor is justified in submitting a lower tender for work on a building to be executed in the winter season. At the same time my experience and observation has been that a client who is obliged to pay for caretaker and for fuel during the construction, also for loss of interest on the work, does not save anything thereby. My advice in future will be for my client to make as early a start as possible in the Spring, and excepting strikes, I think that his work would cost less and he would be farther ahead by the end of the season.

GEO. W. GOUINLOCK.

TORONTO, April 30th, 1903.

With respect to plastering in winter or summer months would say that the extra cost for plastering in winter as against summer is about 2 per cent., but occasionally a contractor being slack and wanting to keep his men employed will cut the figure a little for that particular purpose. This does not include furnishing heat which would still add about 4 per cent.

J. M. GANDER.

MONTREAL, April 30th, 1903.

As to the comparative advantage of doing inside iron work in winter or summer, we may say that according to our experience there is very little difference. There may be an apparent difference in lower wages in the winter, but taking the cold into account, which frequently prevents men from doing their best, and the cost of heating, which is a large item, it brings the cost of producing the work up to the highest summer level. In summer wages are somewhat higher, but the conditions are more favorable for doing work, and men will accomplish more than in the winter; therefore we consider that there is no difference from point of cost in either winter or summer.

H. R. IVES & CO.

MONTREAL, April 30th, 1903.

As a result of an experience of sixteen years in the business, I am prepared to say that inside work on buildings of the fireproof class can be done cheaper in winter than in summer, and as far as terra cotta fireproofing is concerned, the winter job is both better and cheaper.

And I have every reason to say that terra cotta fireproof arches, and partitions that are built in winter with a reasonable amount of care are certainly stronger and better in every sense than it the same class of work was done in summer time especially if the terra cotta blocks are kept dry. I claim that there is a better unity between the cement mortar and the blocks than could possibly be obtained in the summer time. I claim this from the reason that the arches in the roof of the Royal Electric Sub-Station in Montreal were placed in position in the month of February 1902 and the plasterers plastered the ceiling in March—the following month—the said roof was about 60 ft. in the clear above the ground floor and the contractor experienced no difficulty whatever. And also the floor arches, the roof, the partitions, etc., of the Guardian building of this city were placed in position between October and February and no doubt the workmen made a better average per nine hours day, and the work is certainly better than could be obtained if it had been done in the summer.

N. T. GAGNON

LONDON, ONT., April 30th, 1903.

With reference to difference in the cost of doing the inside work on a building in winter and summer, would say my opinion, from past experience, is that the work can be done more cheaply in summer for several seasons. In the first place it is necessary to keep fires going to keep the building warm in winter, and we have found that this occupies a considerable portion of the time of at least one man. The fire would invariably be allowed to go out during the night, and have to be put on fresh in the morning, which would mean that the house would be too cold for working for perhaps an hour or more. In addition to this the days being much shorter in winter, it is often impossible for the workmen to see the work properly after 4.30 in the afternoon, whereas in summer there is no objection of this kind. Of course the wages paid are the same per hour summer or winter, so there is no difference in that respect.

S. STEVELY.

LONDON, ONT., April 30th, 1903.

Replying to yours of the 29th, I would say no, the inside work on a building cannot be done more cheaply in winter than in summer, because labor costs the same in winter as in summer. From my own experience, at times I have taken work lower in winter to keep my men employed.

Regarding finishing a house in winter I think the work is much better done, and more satisfactory to the proprietor, as the building must be heated, which dries out the timbers, and with our present heating system greater care has to be taken to prevent shrinkage. A good house I always recommend to be finished in the winter.

WM. TYTLER.

MONTREAL, May 1st, 1903.

I cannot see the economy there may be, in doing inside work in winter instead of summer. Inside work may be considered to be: Plaster work, joinery, painting and glazing, plumbing, gas, electricity, heating.

Plumbing, gas, electricity, heating could be done any time and the quality may not suffer thereby. As to strict economy I don't believe there is any, as working hours are shorter in winter than summer and the wages are as high in winter as summer. It is very well known, at least here in Montreal, that although plaster work is done all through winter, it does not give so good a job and the expense for heating while the work goes on must be added to the regular price.

And should working hours apply just as well to that trade as to others:

As to joinery work, short hours apply, and to have real good work heating must be used, consequently adding to the expense—I don't believe there is any economy on that head. Painting, although not so much affected as joinery from the cold and moist weather, is not I believe done more economically in winter than in summer. As a whole, winter work is a necessary evil, that's all.

JOS. VENNE, Architect.

MONTREAL, May 2nd, 1903.

In reply to your equiry I am of the opinion that the season is no factor in prices. Formerly it was so, when wages were lower in the winter.

WM. E. DORAN, Architect.

LONDON, ONT., May 1st, 1903.

My business it is all outside work and from 26 years experience I find that winter work does not pay unless I get more money for the work than I do in the summer.

JOHN WHITTAKER.

TORONTO, May 2nd, 1903.

Inside work I think, cannot be done with less cost to the contractor in winter than in summer, but it is frequently done I am sure with less cost to the owner, for the simple reason that the contractor, to keep things moving in slack time, takes work cheaper. Every architect is familiar with the carpenter's expression, "Well, we're not very busy now, and could do work cheaper than if left till spring." Whether a contractor is justified in submitting lower tenders in the winter than in summer depends on the facilities of the individual contractor. As the conditions under which the work is done in winter vary more than in summer some would be justified while others would not, in taking work cheaper.

HENRY SIMPSON.

TORONTO, May 2nd, 1903.

In answer to your question I would say that in my opinion work can be done more cheaply in summer at the present time. Some years ago during the dull times workmen were willing to

work for lower wages during the winter season and work could perhaps under those conditions bed one more cheaply, but those conditions do not prevail at present.

R. G. KIRBY.

MONTREAL, May 2nd, 1903.

My experience in over twelve years practice as an architect is that the inside work of a building can be done cheaper in winter than in summer. I believe the reason of this is, that the building operations are more active in summer than winter.

ALCIDE CHAUSSE.

QUEBEC, May 3rd, 1903.

Replying to your enquiry of April 29th, I beg to state that all things considered, I do not see how the inside finish of a building can be done cheaper in winter than in summer, the only difference in favor of the former being a slight increase in cost of labor, practically compensated for by the shortness of working hours and the extra cost and inefficiency of artificial light, to which must be added the cost of heating, which comes very high in an incomplete building. That is my own experience, and I hear it has been strictly confirmed by the experience of contractors on our new theatre, the Quebec Auditorium, where the cost of heating, even under normal fuel rates, would still have overeaten the saving on winter labor.

G. E. TANGUAY.

MONTREAL, May 5th, 1903.

Re price of summer vs. winter work, I would say that I would not be an authority on the question of inside work. With regard to our roofing, of course there is a heavy difference in cost, although we cannot obtain any better price for doing it. Our Montreal winter season's work costs us fully 20% more than the same work during the summer weather.

C. T. WILLIAMS.

TORONTO, May 5th, 1903.

I have always found that men working on buildings always work better during the summer than in the winter They enjoy the fine weather and are in better spirits, can keep their tools in better order. Material can be got in better, while on the other hand, no matter how comfortable a building may be enclosed during the winter, there is always a certain amount of running in and out, dampness in the building, the difficulty of getting to work on time in bad weather, all of which affects the men, and I have always found that I could do my work better and cheaper during the summer than winter and do not consider that any contractor is justified in taking contracts cheaper in winter, the wage question being equal.

H. MARTIN.

TORONTO, May 7th, 1903.

My experience has been that winter work is slightly cheaper. Wages in both seasons are the same, but mill work would be cheaper during the winter months, as the factories prefer to keep running on, taking work at low figures rather than stop machinery or lose good men; and the contractors also prefer to keep going for less returns in order to keep their men together. I prefer winter finishing; on account of the scarcity of work there is a chance to get the better class of mechanics, and the temporary heating of a building is preferable to finish in rather than the changeable atmosphere of summer. My experience has been, without exception, that interior work stands better when done during winter months, and under conditions that are most trying to such work, namely, when artificial heating is being used.

W. L. SYMONS.

MONTREAL, May 7th, 1903.

My experience is that with a climate like ours it is cheaper to do work on buildings in summer than in winter.

In winter buildings require to be heated to prevent water and steam pipes from freezing, also all plaster and mortar of all kinds has to be more closely looked after than in summer, and even if there were no water or steam pipes, plaster and mortar to freeze, the building not being heated there would be dampness which would cause lumber to twist and warp. I am of the opinion that all building trades require more attention in winter than in summer, therefore conclude, building operations are more expensive in winter than in summer.

JOHN WIGHTON.

VANCOUVER, May 5th, 1903.

The writer's experience is that winter finishing is more expensive than that done in summer. Heating, special care of the premises and waste of materials all have to be taken into account, also time for completion, interest on money in the event of the work being prolonged. Winter work means that painting or other branches will be delayed for spring, hence extra time is required. A contractor under certain circumstances might be able to figure lower for winter, especially if sub trades are done by contract and special reduction made to have work going on during the dull season. Over here in British Columbia we consider a contract requires a higher figure, but localities differ in this respect. My advice would be do everything possible during the summer months, put on extra men and rush the work—save time and save money.

E. COOK.

WINNIPEG, May 8th, 1903.

I consider it worth from 10 to 15% more to finish work in winter than in summer, besides getting a better job done in summer.

W. F. LEE.

MONTREAL, May 16th, 1903.

We know that in our line it costs less to do our work in the summer than it does in the winter. The long light days and the more comfortable climatic conditions are all in favor of summer work. It used to be the custom to reduce wages in the fall, which has probably given rise to the cheaper idea. But men now get as much per hour in winter as in summer.

J. W. HUGHES & SON.

VANCOUVER, B. C., May 7th, 1903.

Your enquiry of April 29th at hand. Will answer with few lines covering my observations for over twenty years—providing the wages paid per hour are the same in winter as in summer. I consider the work will cost at least fifteen per cent. more in winter than in summer, and in seven out of ten cases, the finished work does not give the satisfaction to owners or architects that the summer work would have given at the less cost. The imperfect light in most parts of the building for two to four hours each day (although men are only working from 7 to 8 hours daily), the imperfect heating and drying of most buildings, during finishing; the extra amount of time required in cleaning and caring for the finishing materials are the chief contributors towards their extra cost. Under conditions favorable towards contractors, with an oversupply of labor to select help from (only the best of men will be used) and the men anxious to hold their positions by working well and doing good work the fifteen per cent. extra cost referred to might be reduced to about five per cent. or in some cases brought even with cost of summer work.

C. P. SHINDLER.

LONDON, ONT., May 11th, 1903.

Yours of April 23rd received and the contents considered by the Board of Directors at their last meeting. They were unanimously of the opinion that building contractors were not under any condition ever justified in submitting lower estimates for winter work. The lack of proper light and heat are of course the two principal hindrances to work being done as cheaply in winter, and added to that in some trades, particularly bricklayers and plasterers, is the very great waste attendant upon winter work.

GEO. S. GOULD,
Secretary, Builders' Exchange.

VICTORIA, B.C., May 6th, 1903.

My experience as a contractor teaches me that work cannot be done cheaper during the winter months, than the summer months. The material is in better condition to work in the summer and much more easily cleaned to a smooth surface. In this climate we have considerable rain during the winter months; the atmosphere is damp and penetrating and buildings erected during the winter require fires to prevent dampness penetrating and swelling the inside finish. The dry saason has the advantage as to cost. We make no difference as to cost summer or winter.

H. C. MCKILLICAN.

SAN FRANCISCO, CAL., May 12th, 1903.

My opinion is very positive that work can be done inside building much cheaper in summer than winter in any

city in Canada. The climatic conditions in California, U.S.A., are such that it does not make much difference. In summer you have climate in your favour; your building is more accessable; it costs nothing for artificial drying; you have no frost to contend with and your men have no broken time. I know I was caught twice in winter time—once in Vancouver, B. C.—when building Molson's Bank the frost brought down the Bank ceiling, which was very expensive; this was four years ago; two years ago I was caught with Rossland Post Office in winter time, and in that case it cost over 25 per cent. more. Carpenter work likewise suffers as does also painters' as they are nearly always bumbugged waiting for plastering, etc.

THOS. BRADBURY.

VICTORIA, B. C., May 11th, 1903.

We can do work cheaper in summer, as everything is dry and in much better condition. The only reason that we know could be advanced for cheaper winter work is that there is not usually as much doing in winter, and rather than be idle, sometimes work is taken cheaper.

E. W. WHITTINGTON.

VANCOUVER, May 9th, 1903.

As far as our experience goes in this city, and we have been in the business for fifteen years, inside work costs slightly more and is not so satisfactory when done in winter—that is to say in the months of November, December, January and February.

1st. A striking feature of this climate is the dampness of these months, making it necessary to close in a building and provide heat; where there is a furnace it is simple, but in many cases temporary stoves are needed; either way means more or less extra cost, risk from fire and disfiguring of walls with smoke, etc. 2nd. The plastering in nearly all cases is not properly set and consequently many more cuts and marks will occur in it which can never be made as good as the original. 3rd. Creat care has to be exercised in getting the finishing lumber on the job in fine weather, and even then sometimes it is caught on the road in a storm which makes trouble, sometimes having to be renewed. 4th. As to labor, there is a steady demand for good men the year round, so that wages are the same, but the dark days are no profitable, for even though the hours are reduced to from 8 a.m to 4 p.m., there are still days when it is too dark before quitting time. With all these items against us, contractors here figure no higher for inside work coming in winter, for the reason that it can be pushed along, whereas outside work at the same time may drag with uncertainty, carpenters at the best not averaging more than three quarters of the time outside, and bricklayers less during this period.

BAYNES & HORIE.

TORONTO, May 9th, 1903.

My opinion is, 1st, you cannot make the same progress; 2nd, you cannot make the same job in winter as in summer. In winter it takes from 12 to 15 days to dry out the first coat of plastering before it is ready for the second coat, and that has to be done with furnaces, which means time and money that you have not to expend in summer. Also you have got to take into consideration waste of material in our line (plastering) which does not take place in summer. Therefore I fail to see how work can be done cheaper in winter than summer.

JNO. NELSON.

VANCOUVER, B. C., May 6th, 1903.

Re cost of inside work in summer v. winter. My experince is that there is very little difference. Where trade unions regulate the wages, making them the same per hour throughout the year as they generally do, I think the cost of inside work as well as outside work is greater in winter than in summer in our Country (Canada). There is more to contend with in several respects—such as bad light, too much moisture or frost, expense of heating and drying, difficulties in caring for materials. On the other hand a better grade of men can usually be obtained in the winter season; this is an advantage which almost makes up for the disadvantages, but not quite in my opinion.

A. E. CARTER.

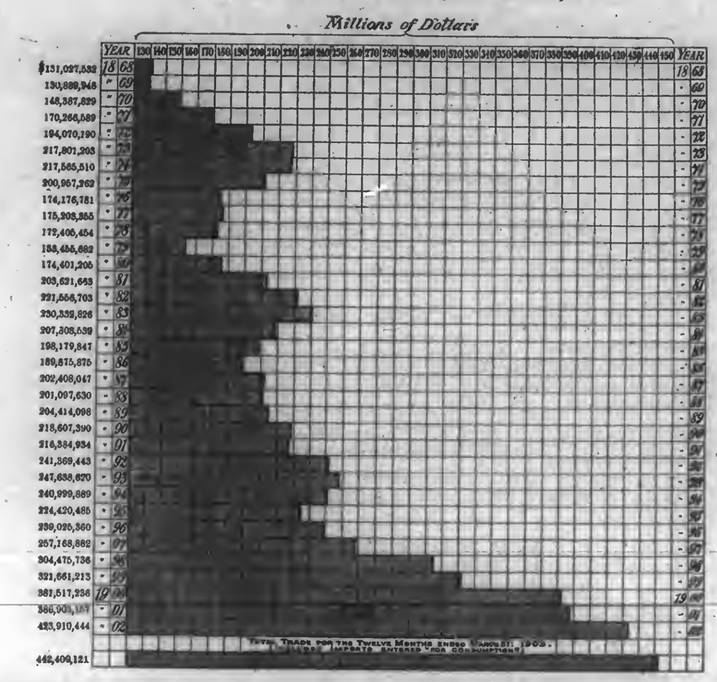
TORONTO, May 19th, 1903.

My opinion is that the inside work of an ordinary building, whether residential or commercial, cannot be executed more cheaply in winter than in summer. My reasons for this opinion are: 1st,-Artificial heat must be provided; 2nd,-Workmen always do more and better work in the bright days of summer than in the dull days of winter.

J. W. SIDDALL.

TOTAL TRADE OF THE DOMINION OF CANADA

FOR THE FISCAL YEARS ENDED JUNE 30TH, 1868 TO 1902.



PRACTICE.*

By R. M. Butler.

One of the first duties of an architect is to strive to administer his contract so that it may work out not only a substantial and creditable building, but that the contract may be carried out pleasantly and profitably to both parties to it. He should, so far as is consistent with his duties, aid in making the work reasonably profitable to the builder who has to earn his bread by such work. The architect must avoid being a partisan—above all should he disassociate himself from that class of employer to whom every builder is a rogue; he should if possible teach him better, or, if that be impossible, at least protect the builder. On the other hand, he must be prepared for the unscrupulous and dishonest builder and the builder who has a tendency to rush or curtail and cheapen work.

Then there is the tendency to accumulate extras from the day the first sod is dug. Builders who take work too cheaply are prone to encourage the young architect to make changes in his design, but if the practise is indulged in extras mount up and lead to friction in the end. Young architects must also be on their guard against becoming their employer's tool. He must be made to clearly understand that while every change does not necessarily mean an extra, it generally shapes that way. In a building of much artistic quality and detail changes are almost inevitable. The architect is not worth his salt who cannot improve upon his paper design, but in small or plain buildings there is less excuse for extras and alterations.

The two main causes of unpleasantness in building contracts are, first, extras and, secondly, cases where the builder is not made to clearly understand what it is he has contracted to do and finds later he has let himself in for more than he thought. This arises generally from his own stupidity or neglect, and sometimes from insufficiency and want of clearness in the quantities or in the plans and specification.

As to the first cause, we all know the insidious way in which extras arise. Frequently, in order to get a tender at a desired figure, the design is so cut down that extra items have to be inserted during progress, and this is scarcely calculated to please the employer.

One of the things which has most forcibly struck me is the unwillingness of many employers to frankly state the limit of cost they will go to. There are no bargains in building contracts. The full value must be paid if the work is to be sound. An architect is like a doctor; if the employer is to get the full benefit of the architect's services he must be perfectly frank with him; and it is the architect's business for his own protection, too, to keep him well up to this.

Having got so far, the architect's business is to keep the employer as free as possible of extras, of disputes, of law, and above all of so-called friendly arbitrations. My experience is that two actions at law are not so bad as one formal arbitration. Arbitrators seldom please either party: and if differences arise between the parties which cannot be settled by friendly give-and-take, or by the mediation or authority of the architect, let the issue be knit and tried by the best of all arbitrators—twelve jurymen, as I heard the late Judge Murphy say—or, what is even better, before an experienced, clear-headed and impartial judge. There is infinitely more chance in this of a satisfactory and equitable issue; but avoid law if you can.

Clear instructions having been obtained, let the plans and specification be plain and lucid, admitting of no misconception, accurate and workmanlike. If you have, for instance, an irregular and hilly site, let it be carefully levelled and the depths of the foundations at every point shown on the drawings; this is ever so much better than settling it when the trenches are opened, as is sometimes the case.

In the specification avoid conventional "padding" as much as possible. Let the work, however, be fully described in every detail, giving dimensions wherever possible. The most common faults in specifications are omissions. See that nothing, however unimportant, is left out.

Builders tendering are entitled to much consideration. They go to great trouble and expend much time in a labor for which only one can hope to be recompensed. Be scrupulous in such little matters as only opening the sealed detailed bills of men whose tenders are actually under consideration. Some builders don't care a jot about this, but others do.

Having secured a builder, the great thing is to be clear and thoroughly understood in all your drawings, details and instructions and orders of every kind. Let the last be as far as possible in writing. Order no important extra without acquainting the employer, for you are handling his money and pledging his credit.

Be careful when ordering extra foundations that you know what you want done and are getting no more and no less.

As regards clerk of works, I believe their utility to be enormously overrated. A good clerk of works is a jewel above price, and correspondingly rare. In great buildings of some intricacy, or in very remote places, a clerk of works is essential for administrative purposes and for working out troublesome problems on the spot; but in such cases he becomes really a conducting architect or architect-in-charge. The average clerk of works on an average medium-sized building is, I think, a useless luxury, and his wages might more profitably be spent upon the building itself.

I believe a downright dishonest builder is very rare—it is not to his interest in the long run; but against such a man the ordinary clerk of works is worse than useless, for his interference only incites foremen and puts them on their mettle to see how far they can fool him. I have seen many instances of this.

If you do have a clerk of works, insist upon his keeping very carefully and fully a diary, in which he enters everything of the least importance on the job, and, above all, insist on weekly reports—otherwise you are better off without a clerk of works. Do not allow him to get into the habit of ordering extras, however small The employer is not liable for such orders, but it is unpleasant to have to repudiate them.

In my own experience I have met with one, and only one, man who was really useful clerk of works and saved the architect much trouble.

I see by the address of the president of the Royal Institute of Architects of Ireland that the builders are pressing their case for a revision of the existing conditions of contract and that the two principal points are, first, the introduction of an independent architect in every building contract who shall be a sort of permanent arbitrator between builder and architect, and may be appealed to at any moment during the progress of the building to decide questions of materials, price, quantity and the intepretation of the plans and specification. I fail to see either the need or the equity of this, or how any architect would willingly submit to have his judgment daily and hourly questioned by a quarrelsome cantankerous builder. Even if the private architect yield to this, I think few corporations or public bodies will agree to this procedure. The other point is making the quantities part of the contract; with this also I disagree. That a builder should be compelled to do any work for which he is not to be paid, all because of the surveyor's error, is no doubt hard, but he takes the quantities at his own risk and it ought to be possible to devise some other safeguard, either by making surveyors guarantee their quantities or by some arrangement of independent checking. To say that an employer might at any moment during the progress of a building find his outlay compulsorily doubled would be an element about which there would be no finality, one which might lead to the employer's ruin, and would certainly tend to cripple and discourage building enterprise.

Both these proposals are, I think, clumsy and unworkable, and the builders have not proved the need for any such radical change in the whole principle of existing methods.

As to the architect's administration in general of the building. He should be possessed of sufficient legal knowledge to know how to act under all ordinary emergencies, such as the death, insanity or bankruptcy of the builder, the compulsory taking over of the work, dealing with refractory builders in regard to defective materials, and so on.

* Abstracted from a paper read before the Architectural Association of Ireland on December 16th, 1902.

PERFECT PLANNING.

Mr. Butler Wilson, in the address he delivered as President of the Leeds and Yorkshire Architectural Society, spoke of the hindrances which interfered with realization of perfect planning. Architects often have to deal with a site which bristled with obstacles and restrictions, and in such case it would be a fatal mistake to endeavour to place there a preconceived arrangement only suitable for some totally different situation. Rather should they endeavour to turn obstacles into advantages. Though they might have the desire to make themselves thorougly acquainted with the needs of the client, those endeavours were often met by ill-concealed indifference—an indifference which often expressed itself in some such words as "get the building finished, and we will adapt it to our requirements." But that was entirely unsatisfactory. Architects must be determined to fulfil requirements in a far more complete way than their clients had ever imagined.

Another difficulty was that of adapting the acknowledged forms of architecture to the ever-increasing advantage of modern constructive inventions. The fight between material and imagination did not decrease with the advance of time, and there was no doubt that many accepted forms were, under certain modern conditions, far from applicable to functions which this age demanded. To grapple with those demands and at the same time preserve the essential qualities of their art was the task which lay before them. This could best be done, not by ignoring or rejecting inventions and appliances which, on the grounds of their practical utility, had come to stay, but by a frank acknowledgement and acceptance of their value, and a determination to make those inventions their servants rather than their masters. They must be ready to progress in that respect, and to seize upon all that was best in modern constructional methods, for there was no law born of past experience which might not be instantly repealed owing to the appearance of new conditions and materials.

If architecture as a fine art was to live it must adapt itself to present needs. Iron and steel had almost ousted carpentry from buildings of any size, and the arrival of the flanged beam and iron joist marked a great era. Steel, combining as it did the virtues of cast and wrought iron, could be utilized for supporting enormous loads. The idea that constructive metal-work needed concealing from view was rapidly dying out. They were now able to build a partition 2½ in. thick which local authorities recognized as a 9 in. brick wall for fireproof purposes. Architects were, indeed, feeling the steady invasion of the technical constructor. Technical construction was advancing, and they must not allow the constructive specialist to gain an ascendancy.

THE QUALIFICATIONS FOR AN ARCHITECT.

These were summed up by Mr. G. S. Aitken in a recent address to the Northern Architectural Association as follows:—It is needful for the architect to be a man of culture, that he may have a mind open to all claims upon him and the best way to meet them. A man of taste, that he may do the right thing, whether in the use of form or the application of colour. A man of some degree of personality, that he may, avoiding the slavish copying of past work, give the world the best of his own. An alert man, ready to use the new inventions, taking care to do this with a well-balanced mind. An enthusiast, in favour of all that is good in the old, and yet looking forward to what may come, as well as backward to what has happened. A man in sympathy with the great students and thinkers who are able to influence his labour more than many seem to consider. One, thankful to all the great art writers who have worked in the right spirit, although he may not agree with all their conclusions. Seeing poetry in his art, that gives it proportion, grace, and lovely colour, as well as the prose that ensures stability of construction and consideration for the material needs of man. In sympathy with Nature if he would have his work full of perennial freshness, and seeking to become master in the knowledge of those principles by which through the Creator the world lives, moves, and has its being, so that they may have an influence on and find a place in the work he brings into existence.

The retirement is announced of Prof. William R. Ware, for twenty-two years professor of Architecture at Columbia University.

"If a doctor makes a mistake it is promptly put underground, but if the architect makes a mistake the building is forever staring him in the face. Let him spare no trouble, therefore, to make whatever is entrusted to him, no matter how small, as perfect as possible for its purpose, and as beautiful, regardless of whether it is going to pay him or not. Art in architecture consists in being simple and truthful. The ability of an architect is not determined by the amount of material he uses; one might almost say that as much ability is required to build a house as to erect a palace. Above all he should be ambitious, aim high, and he will hit the mark sooner or later."—Architecture.

SKETCHING IN CHARCOAL

Mr. Ralph Hedley, R. I. B. A., recently delivered an address on this subject before the Northern Architectural Association in which he said charcoal had been appreciated by artists for ages, but he did not think it had been quite sufficiently appreciated by architects. The reason why he advocated charcoal so much for drawing details of what ever kind of decoration was required was because it lends itself so readily to what one desires to express. Delicate, sharp or soft lines ; broad and delicate tints ; broad and decided shadows could be produced with charcoal with much more ease than with pen or pencil. With charcoal they could give all relative planes, of any required depth or strength, quality and feeling. That was of the utmost importance, and would enable details to be understood at once—that was projections and sinkings—if great care was taken to imagine a light coming from either the right or the left. In showing relief in a design, if they got the light full on it was rather deceptive when it was handed over to be executed. It was often very difficult to know whether the designer of some piece of ornament intended parts to be concave or convex without showing a section, and it was quite impossible to show sections in delicate parts of foliage. If a little thought was displayed in drawing, it could be expressed and understood almost as well as working from a model in relief. It was extremely difficult to express with pen or pencil in full-sized drawings. By the pressure required and the trouble involved in drawing a great number of thin lines all freedom was lost, and with freedom certainly individuality must be lost, and he thought every drawing of decoration should have individuality. The easiest way of getting individuality was by working with something that expressed thoughts, and they could not help themselves if they used charcoal freely. Their own feeling was bound to crop up.

PROFESSIONAL CHARGES.

The commission paid to architects will always be a subject of controversy until the meaning of a uniform scale is understood, says the Building News. Why every class of building, plain and ornamental, simple in plan and construction or complex, should be charged for at the same rate on the total cost it is difficult to say. The rate may vary in respect of the cost of the building—why not also according to the degree of complexity of design and skill required ? As the more complex the design the greater is the cost of construction, it follows that the professional services necessary may be valued in an inverse proportion to the skill and labour actually expended on the work. So it is, at least, in a very large number of cases which require not only a high professional skill and personal attention on the part of the architect, though the building may be comparatively small. Expenditure we know runs up on the plainest building when there is a large quantity of work or unskilled labour, as—say, in the construction of factories, sheds, workhouses, barracks, and other buildings, also in the multiplication of one design ; but the two kinds of cost must be kept separate. If it is fair to reduce the rate of percentage from 5 per cent. when the cost exceeds a certain sum for plain buildings, or for repetition of the same set of drawings, it is obviously equally unfair and unjust to expect the architect to design and personally superintend an elaborately-planned residence, hotel, or technical school at the same rate as he would ordinary dwellings or cottages. In other words, if he is expected to throw off 1 or 2 per cent. in any large buildings where there is great repetition or an enormons expenditure in foundations or brickwork, he is entitled to a higher rate per cent. upon those designs which are largely made up of fittings and decorations, the cost of which work does not exceed a certain sum. It seems absurd to fix a certain rate of 5 per centum as an arbitrary standard of remuneration unless we fix also the description and cost of the building which it represents.

SIZE OF WINDOWS IN RELATION TO FLOOR SPACE.

The following conclusions are the result of a careful enquiry recently made at Cornell University to determine the size of windows required to give an adequate supply of natural light to the lecture rooms between 8 a.m. and 5 p.m. All the rooms in question had unobstructed light :—

1. There is to be at least 150 ft. of window-space for each 1,000 sq. ft. of floor-space in rooms which, in use and location, are similar to those here described, and are lighted only from one side. Therefore an office 15 ft. by 25 ft. should have at least 56 sq. ft. of window space, and a class-room 30 ft. by 40 ft. should have at least 180 sq. ft. of unobstructed lighting surface.

2. The proportion between the height of the window-tops and the depth of the room lighted should be at least 500 to 1,000, or, in other words, the distance from the floor to the window-tops should be one-half the depth of the room to be lighted.

The American Architect observes that these figures support the old principle that "top-light" is the best ; the nearer the window-tops come to the ceiling the more efficient will be the lighting to be secured from a given surface. Care should be taken that overhanging lintels be not allowed to obstruct the light.

NOTES.

Mr. John Woodman, M. Can. Soc. C.E., formerly engineer of the western division of the C.P.R., has opened an office in the Merchants' Bank Building, Winnipeg, as consulting engineer and architect.

To complete the repairs of the Doge's Palace, Venice, it will probably be necessary to place beams across the canal over which the Bridge of Sighs is built, the beams resting on the wall of the prisons, to support the portion of the leaning wall fronting the canal.

Mr. Andrew Carnegie has offered to give unconditionally a million dollars for the erection in New York of a building to be used as the headquarters of the four great engineering societies of the United States and the Engineers' Club of New York.

The Western Architect is of the opinion that while concrete has been used for many purposes foolishly of late, as was inevitable, yet the building public have only fairly begun to understand its legitimate uses. While it is rapidly displacing stone for footing courses, its value as material for foundation walls, particularly in clay soils, has hardly occurred to builders generally. In these, careful excavation may be made, the earth making the outside of the mold for the concrete wall, which not only reduces the cost of planking below grade one-half, but lets the wall fill solidly against the earth, thus doing away with the annoying leaks that inevitably follow the laying of stone foundations in clay soils. Here concrete may displace stone walls, fewer cubic feet of materials producing far better results. Again, the Portland cement tile for floors has only begun its invasion of buildings.

ARCHITECTURAL COMPETITIONS IN BRITISH COLUMBIA.

An architect at Vancouver has sent us particulars of a competition for plans for a High School building to cost $70,000. The circular of conditions he characterizes as one of the most impudent productions he has ever seen. After describing the requirements of the proposed building, the circular concludes as follows :—"An estimate will be required as follows; viz. : for heating with steam direct, and indirect; hot water and hot air; the fan system to be adopted when heating by indirect steam and hot air. The entire cost of the building not to exceed the sum of $70,000 ; the architect to give a written guarantee to that effect. The following are the conditions upon which the plans are to be submitted; viz. : that all plans shall be the property of the Board, and that they shall have the right to use any portion of any plan or any ideas embodied therein. The Board will give prizes as follows : one of $75.00, one of $50.00 and one of $25.00. The architect whose plan is accepted shall not receive any prize, if he is retained to carry out the construction of the building."

What a rare bit of "nerve" is here exhibited by a body of men who, as our correspondent states, officially represent the education of the community! What a paradox to spend seventy thousand dollars for a building for the higher education of the rising generation, while at the same time asking a body of educated men of the present generation to give their services for nothing!

The young men and women for whom it is proposed to build this high school may be expected to question the wisdom of attending the institution if the knowledge they might gain would have no money value. From a money making standpoint they would do better to become day laborers or mechanics according to the implied standard of values of the representatives of education having charge of this competition.

It may safely be assumed, however, that if architects would hold their profession or calling in higher esteem, and show less anxiety to get work by any means and at any price they would not have made to them such absurd and insulting proposals as the one here referred to.

LEGAL.

An application having been made to the Irish Institute of Architects for information respecting the responsibility of an architect in connection with foundations, the hon. secretary was directed to reply that in the opinion of the Council it is not part of the recognised duty of an architect to sink trial pits to ascertain the nature of the ground upon which a building is to be erected, although in exceptional cases he may, if he thinks it advisable, recommend this to be done at the expense of the employer. The Council consider that the system universally adopted at present is equitable, as the employer only pays for the work which is actually executed. Summary statements of law, especially when formulated by laymen, are not always to be approved, says the Builders' Reporter, and there is a risk of the advice thus given being misunderstood. There are enough decisions to suggest that an architect is expected by English law to examine the site for a building or to have it examined for him, and he is liable for neglect if any damages should arise through acting on incorrect information. Although the builder is responsible for executing proper foundations, the architect is not in consequence exempted. If the builder should suffer loss he cannot look to the architect for compensation. In France the architect is liable to the client as well as to the contractor. Responsibility is believed to be evaded in England by avoiding to state the nature of the soil, either in a specification or on a drawing. But that is a doubtful expedient which has not been tested in the courts. The omission would be regarded with suspicion by judges. To ascertain the nature of the soil may sometimes be an expensive operation, in which case the advantage of making borings or trial pits should be explained to the building owner, and his sanction obtained for any necessary outlay. But in ordinary cases no architect who is careful of his reputation will neglect to ascertain the nature of the ground on which one of his buildings is to be erected.

NOTES.

The National Sculpture Society of New York, recently accepted for one of their exhibitions at Madison Square Gardens a piece of sculpture by Miss Florence E. Ward, of Toronto.

The special art scholarship of £60 given by the City Council of Liverpool through the Technical Instruction Committee has been awarded this year to Miss C. E. Martin, of the School of Architecture and Applied Art, University College, Liverpool. The scholarship is tenable for one year at London or some art centre on the Continent.

A French architect, M. Leon-Jean Roux, is said to have bequeathed to the Academie des Beaux-Arts a sum of 800,000 francs, or over £30,000 of English money. The income is to be applied to the creation of annual prizes in painting, sculpture, architecture, miniatures and illuminations, which will commemorate the names Destouches, Delarge and Roux. The academy already possess several funds for similar purposes, but the capital in each case was inferior to the amount bequeathed by M. Roux.

The director of works has decided to have the buildings of the Louisiana Purchase Exposition colored ivory white instead of old ivory white. Ivory white approximates very nearly the dead white which was used at Chicago on the Columbian Exposition. It has in it just a tinge of yellow. The departure from the dead white is expected to gratify the eye of the visitor, relieving somewhat the oppressive glare which characterized the Columbian Exposition during the sunny days. The departure from the white is not, however, sufficient to impair the majesty and dignity with which a great stretch of white facade impresses the spectator.

The Wesleyan chapel at Exeter will be the first large edifice in England erected by the Cottanein system, which has of late been quite extensively used on the continent. By this system, which originated in Fance, strength, durability, and also adaptability at moderate cost are secured by means of a skeleton of soft steel wire interwoven in the hollow of a special form of brick, or interlaced basket-fashion in varying thicknesses of cement. The building will have an inner and outer shell of three-inch brick covering a steel frame. The air-space between the two walls can be utilized for ventilation, and whereas the air-cushion will keep the interior cool in summer, it will also simplify the task of heating in winter. There is a further very important advantage in that the edifice will itself be fire-proof.

It has been proposed by certain foreign architects who practice in districts where great trouble is experienced from the destruction of brickwork by alkaline incrustations, to lay down a maximum limit for the presence of such impurities in bricks, and to reject all goods which show an excess over this limit. The amount of sulphur dioxides in a powdered sample brick is estimated, and a direct test for the influence of sulphates is also made, the bricks being treated in a vessel with a saturated solution of sodium sulphate by boiling for half an hour and then exposed to a current of air until an incrustation appears. This is repeated no fewer than forty times, after which the residue is dried at 1,000 deg. C. and weighed. The results, which are expressed in percentages of the original weight of the brick, give what is called the coefficient of susceptibility to attack by sulphates.

Choir screens originated from the stone balustrade or railings which separated the presbyterium from the other parts of the ancient basilica. They were afterwards retained to separate the space devoted to the clergy from that portion allotted to the congregation. Choir-screens were frequently of the most elaborate design, and were adorned with statues and traceried openings or panels. On the Continent many magnificent examples are to be found. The screen of the minster at Basle, that at Havelberg Cathedral, Munster, Germany ; and the Magdalene Church, Troyes, France, are splendid instances of choir-screens. In England we name Long Sutton, Kingsbury, Barnwell, Newark, Stanton Harcourt, and Chester Cathedral, in which churches the screen or rood-loft appears to have been used. The parclose screens at Fyfield (Berks), Ingham (Norfolk), Lavenham, Long Melford, Southwold, and Spalding, are good examples of wooden screens of the Perpendicular period.

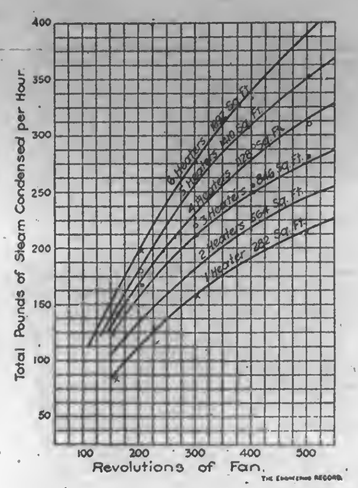
TEST OF A CAST-IRON HEATING SURFACE IN CONNECTION WITH A FAN SYSTEM OF HEATING.

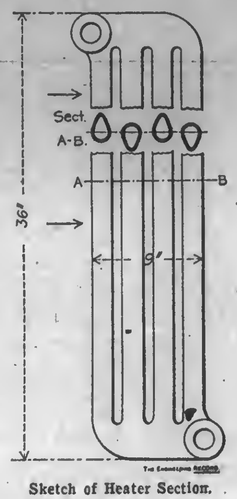
At the ninth annual meeting of the American Society of Heating and Ventilating Engineers a paper was read by Prof. R. C. Carpenter on a test made at Sibley College, Cornell University, of a cast-iron heating surface used in connection with a blower fan for heating the air. The data and record of the test in slightly condensed form reprinted from the Engineeridg Record, are given herewith: The heating system was arranged specially for the experiment by the American Radiator Company and consisted of twelve radiators placed side by side in two rows of six each, one row above the other and extending parallel to the flow of the air. Each radiator was composed of 21 sections, each of which was a single casting 9 x 36 inches, in the form of four nearly triangular tubes, slightly staggered, with half-inch air spaces between the tubes, all as shown in the accompanying sketch. Each section has a surface of 6.7 square feet giving a total for the whole heater of 1,692 square feet.

The fan drew the air over the heater and discharged it into a small chamber, to remove eddies, and thence through a delivery pipe and nozzle, where its velocity was measured, into the room. The fan used was made by the American Blower Company and was of the following dimensions: Height over all, 80 inches; diameter of wheel, 48 inches; width at periphery, 17.5 inches; inlet diameter, 30 inches; outlet, 27 x 27 inches. The fan was driven by a 6 x 6 inch vertical engine and was arranged to run at different speeds. The individual radiators were controlled independently so that it was possible to make tests with different amounts of heating surface.

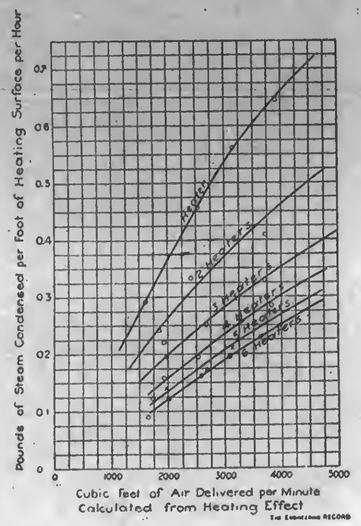
The general results of the test are shown in the accompanying table, which contains a selection of eighteen runs from the twenty-eight as given with the report. Three runs at different speeds are given for each of the six different amounts of heating surface used, each amount representing a unit consisting of two superimposed radiators. The diagrams herewith show the relation between the speed of the fan and the pounds of steam condensed per hour for different amounts of heating surface; and the relation between the pounds of steam condensed per square foot of heating surface per hour and the cubic feet of air discharged per minute by the fan, for different amounts of heating surface. These curves show at a glance the proportionate decrease in the benefit derived as more heaters are added. In the discussion following the paper Prof. Carpenter stated tnat beyond 16 pipes, or in this case four heaters, the advantage gained was slight.

Three other diagrams presented with the paper but not given here, show the relation between the steam condensed for different speeds of the fan; the relation between the temperatures of the entering and discharge air; and the relation between the speed of the fan and the steam condensed per square foot of surface per hour, for different amounts of heating surface. The author was assisted in the test by Messrs. Neave and Cazenove, graduate students in the University.





Sketch of Heater Section.



Result of Tests.

a. Number of run	1	3	5	6	8	10	11		
b. Number of heater units	1	1	1	2	2	2	3		
c. Heating surface, sq. ft.	282.	282.	282.	564.	564.	564.	846.		
d. Steam press., lbs. abs.	24.69	24.81	24.81	24.60	24.87	24.77	24.81		
e. It. P. M. of fan	161.	303.	500.8	155.4	304.1	501.5	205.3		
f. Static head, ins. water	0.207	0.707	2.204	0.203	0.774	2.21	.314		
g. H.-P. consumed by fan	0.387	1.182	4.178	.0997	1.122	4.17	.3269		
h. Vel. disch. head, ins. water	0.184	0.780	2.29	0.193	0.763	2.18	.201		
i. Steam per sq. ft. heat. sur. per hr., lbs.	0.293	0.501	0.721	0.22	0.334	0.408	0.106		
j. Temp. air received	73.6	73.4	72.3	81.0	81.	83.0	74.1		
k. Temp. air delivered	125.1	124.6	118.8	143.7	150.4	146.1	158.9		
l. Rise in temp. of air	51.5	51.2	46.5	62.7	70.4	63.1	84.8		
m. Temp. water leaving coils	211.7	189.4	186.7	215.6	205.	209.	207.4		
n. Wt. of air disch. per min, lbs.	109.	214.	318.	132.	163.	253.	134.		
o. B. T. U. per sq. ft. heat. sur. per hr.	285.3	556.	750.	208.5	325.	397.	190.5		
p. Air disch., ft. per min., meas.	1092.	3520.	5815.	2017.	2586.	5000.	2478.		
q. Air enterg coils, ft. per min., meas.	234.	412.	683.	235.	401.	675.	273.5		
r. Cu. ft. air per min., calc.	1005.	3150.	4700.	1940.	2400.	3720.	1970.		
s. Ratio of expansion of air	1.095	1.097	1.090	1.116	1.128	1.120	1.150		

Result of Tests.—(Continued.)

a...	12	14	15	17	19	20	21	23	24	26	28
b...	3	3	4	4	4	5	5	5	6	6	6
c...	846.	846.	1128.	1128.	1128.	1410.	1410.	1410.	1692.	1692.	1692.
d...	24.81	24.81	24.60	24.75	24.47	24.84	24.75	24.70	24.60	24.77	24.77
e...	302.	502.	159.6	301.5	502.4	203.	304.	501.	154.1	302.08	403.
f...	.746	2.107	0.173	0.733	2.08	0.32	0.74	2.07	0.197	0.743	2.08
g...	.864	3.774	.2249	1.004	4.12	.367	.778	3.38	.	.	.
h...	.733	2.15	0.167	0.724	2.05	0.28	0.72	2.04	0.103	0.718	2.04
i...	0.251	0.33	0.123	0.195	0.284	0.140	0.174	0.25	0.00	0.103	0.232
j...	70.1	80.2	80.0	83.0	80.0	69.9	86.6	91.4	84.4	77.0	74.0
k...	159.1	160.3	159.4	160.4	164.4	172.3	177.6	177.8	174.1	182.3	179.2
l...	89.0	74.1	79.4	85.5	84.4	102.6	91.	86.4	89.7	105.8	105.2
m..	206.3	203.4	210.6	203.9	203.	199.6	204.2	216.4	216.2	215.4	212.3
n...	182.	257.	110.	175.	265.	126.	180.	275.	114.	177.	256.
o...	237.8	222.8	118.8	190.5	276.5	137.3	170.5	240.	862.	156.4	223.
p...	3560.	5890.	1092.	3500.	5960.	2518.	3570.	5980.	2022.	3560.	5960.
q...	308.	666.5	221.	389.	662.5	270.5	393.5	663.5	222.	382.	640.
r...	2680.	3710.	1730.	2520.	3830.	1960.	2690.	3980.	1650.	2560.	3610.
s...	1.150	1.134	1.148	1.157	1.156	1.108	1.164	1.158	1.108	1.196	1.198

DEMAND FOR ROOFING SLATES.

Mr. Harrison Watson, Curator of the Canadian section of the Imperial Institute, London, Eng., has written to the Department of Trade and Commerce at Ottawa, regarding a possible market for Canadian roofing slate. He says:

Quite recently a favorable opportunity for developing trade in an article which Canada possesses to a considerable degree has come to my notice. There is in the United Kingdom a very large consumption of roofing slates, many of which are imported. At a time when roofing slates were practically not used in the United States, the quality of slate deposits in that country was so suitable that several quarries were developed and worked solely for export purposes. In 1896 the slate trade with the United Kingdom amounted to some 46 million slates. Gradually, however, the utilization of roofing slates in building operations in America has been adopted, and between the domestic demands and the consequent increase in prices demanded by American slate producers, this export trade has steadily fallen away until at the present time it has almost ceased. Welsh slates, owing to labor troubles, have been also scarce, and United Kingdom buyers have been obliged to look temporarily to France for supplies. The French slate is inferior to American but is cheaper. A company which has developed and established the trade in American slates in Great Britain applied to me for information as to the possibilities of being able to secure suitable supplies from Canada. Upon inspection of a number of sambles of roofing slates from Canadian deposits, the expert informs me that the quality of the Canadian slate is very good and equal to, if not better than, the average American. The company, therefore, state that if they can arrange for regular supplies of the quality equal to that examined by them, they are prepared to contract for large quantities for which they would pay cash.

Provided that further investigation confirms the impression that large deposits of a suitable quality of roofing slate exist in Canada only awaiting development, the establishment of the industry would appear to offer a most profitable investment for capital which will, it is hoped, appeal to Canadian enterprise. The sizes most in demand here are 24" x 12", 22" x 12"; 22" x 11", 20" x 12", 20" x 10", 18" x 12", 18" x 10", 18" x 9", 16" x 12", 16" x 10"; 16" x 9", 16" x 8". They should measure 18 to 19 inches per 100 slates piled up in the flat. Quarrying is a fairly simple matter, the cost of the necessary equipment being less than in connection with most kinds of mining. As to labor, it is pointed out that a large number of experienced slate workers are at present idle owing to labor troubles in this country, and many would readily go to Canada for reasonable wages.

BY THE WAY.

Mr. Chas. Baillarge, the well known engineer and architect, of Quebec has had printed in pamphlet form his interesting paper presented recently before the Royal Society of Canada on "The Construction of an Indestructible Vessel fur a Voyage to the North Pole, and How to Reach it." Accompanying the paper is a map of the polar regions showing recent Arctic discoveries and plans for an indestructible vessel.

× × ×

Some of the ancient monuments in English cemeteries bear quaint epitaphs, complimentary and otherwise, to the departed. Here is one from a tombstone at Awliscombe, Devonshire:

"Here lie the remains of James Pady, Brickmaker,
late of this parish, in hopes that his clay may be
remoulded in a workmanlike manner
far superior to
his former perishable materials,—
Keep death and judgment always in your eye,
Or else the devil off with you will fly,
And in his kiln with brimstone ever fry,
If you neglect the narrow road to seek,
Christ will reject you, like a half-burnt brick."

NOTES.

So far as experimental results now available indicate it would appear that in order to attain impermeability in concrete, whether of gravel or of broken stone, that the mortar mixture must be at least as rich as 1 cement to 2 sand, or 1 cement to 2.5 sand, the proportion of mortar being sufficient to fill entirely the voids, or possibly a little more than that in order to provide for inequalities of mixing in different portions of the mass. Although apparently mortar of 1 cement to 3 sand has occasionally been found impermeable under as high pressure as 40 pounds per square inch, there is little evidence that such a mixture can in general be relied upon. In addition to the importance of these matters of composition to be employed for a permeable concrete, it is undoubtedly also of essential importance that the concrete should be kept thoroughly moistened during the entire period of setting; otherwise not only the ultimate resistance may be impaired, but also the impermeability by the slight contraction of setting in air which has been observed repeatedly. This has a marked influence upon the use of concrete in the walls of buildings, which in their subsequent experience may be exposed to driving rain storms, against which ordinary walls of masonry have frequently been found ineffective.

When an advertiser complains that his advertisement does not interest the readers of a paper, he might do better to change his ad writer than to change his paper. The public is anxious always to be interested, and if the advertisement fails to do it the fault probably lies with the advertisement and not with the public or the newspaper.—Printers' Ink.

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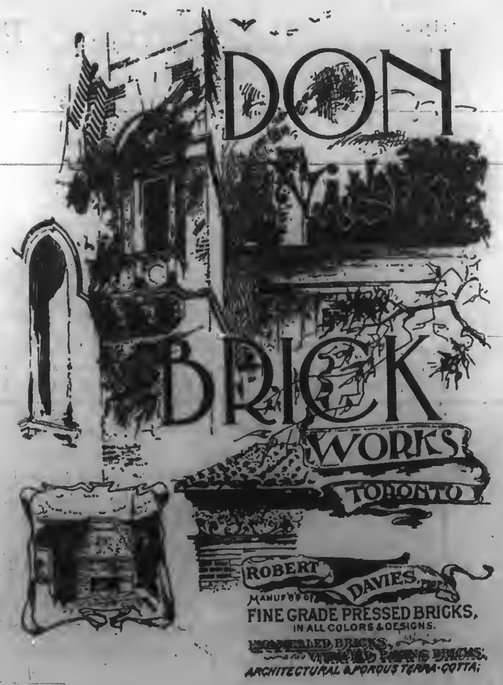
The tenders for certain work proposed to be done at Harbord street Collegiate Institute, Toronto, in comparison with tenders taken for similar work in 1898, were as follows:—

Plumbing	$1,685	$3,475
Masonry	382	1,800
Carpentering	365	707
Painting, etc.	90	129
	$2,632	$6,111



AN ARCHITECTURAL ALPHABET.

A was for architect, old in his prime,
B was a builder who took his own time.
C was a client who had his own views,
D was the details that no one would use.
E the erection he tried to excuse,
G was the ground plan exceeding the site,
H was the half-timber he had to reveal,
I was the ironwork he had to conceal.
J was the joinery, mostly of deal.
K was the king-post that ought to have stood,
L the stone lintel that proved to be wood.
M was the mullion that blocked out the light.
N was the newel too thin for its height.
O the oak sill that was not water-tight.
P was the price on the contract agreed,
Q was the quantities down to a bead.
R was the rage that the client displayed; and
S the sarcastic remarks that he made—when
T was the total that had to be paid.
U was the umpire called on to decide.
V was the value the client denied.
W stands for the words that he said,
X was the xtras for which he was bled,
Y Z the young zealot who wished he was dead.

You might as well try to conduct a business without advertising as to operate machinery without oil.—Printers' Ink.

"Book of 100 Stained Houses" is the title of a new publication by Mr. Samuel Cabot, of Boston. It contains illustrations of houses on which Cabot's creosote stains have been used and unsolicited testimonials as to their value.

Wallpaper of special design for the children's room continues to receive attention from the makers. A recent suggestion is wallpaper panels. They are about 12in. by 36in., and are shown in broad poster designs of life-size duck mothers leading a fuzzy yellow brood to a brook, fox terriers pursuing a red and black rooster, and apparently overtaking him, and processions of beggars coming to town. There are also posters of children going to bed, saying their prayers, eating their breakfasts, or playing. They are artistic, durable, and useful, as inculating a love of art and the beautiful.

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A FIFTEEN-STOREY CONCRETE BUILDING.

A building fifteen storeys high, about 210 feet, in which concrete and steel will form the walls, is about to be erected in Cincinnati. The building inspector, who has to authorize the work, appears to have felt his responsibility in approving of the experiment, and an enquiry was held by him on the subject. It was explained that the concrete construction proposed was stronger and more rigid than steel, and will stand the vibrations and strains due to wind pressure better and in a more perfect way. The strength of the structure does not depend on rivetted joints, but on the monolithic character of the concrete, being all one solid mass of stone held together by twisted steel rods and imparting to it an elasticity equivalent to that of a steel building. The architects of the building are Messrs. A. O. Elzner & George M. Anderson, and the structure will be erected by the Cincinnati Fireproof Company. The building inspector of Philadelphia states that he has had a similar structure under his consideration, and that he had resolved to interpose no obstacle for its erection.

Composition capitals are now being used very largely in Canada. The Detroit Decorative Supply Company are large manufacturers of relief ornaments, staff work, architectural carving and modelling. Their exterior and interior composition ornaments are highly spoken of by architects and builders all over the Continent. The large works of this company turn out this class of goods in a particularly neat manner. They will be pleased to send their new illustrated catalogue to all mentioning this journal and addressing 812 14th avenue, Detroit, Mich.

A new building by-law adopted by the suburban municipality of St. Louis, near Montreal, provides that all new buildings on St. Lawrence street must be of pressed brick or stone and three storeys high at least; they are also to be built on the line of the street. It is expected that a regularity in design and construction will thus be brought about in the great number of business and residential buildings which are to be erected when the land for widening the street has been expropriated. In the new residential streets to be opened up the houses are to be built ten feet back from the line of the street.

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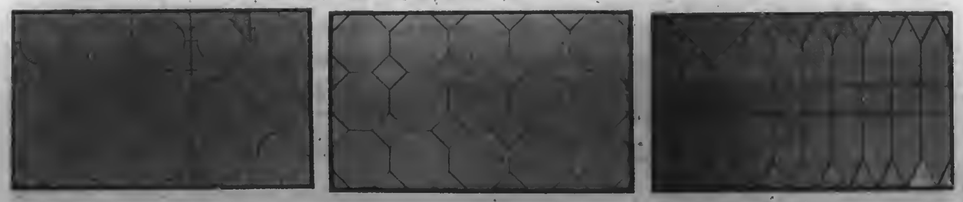

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House in Roxborough Street West, Toronto.

Chadwick & Beckett, Architects.

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House in Crescent Road, Toronto.

S. H. Townsend, Architect.

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An Interior—The Ceiling in a Single Tone of Old Plaster Color; the Frieze an Original Mural Painting in Oil; Wood-work, Dark Weathered Oak.

Decorations by W. H. Elliott & Son Co., Toronto.

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LIVING ROOM, HOUSE IN ROXBOROUGH STREET WEST, TORONTO.
CHADWICK & BECKETT, ARCHITECTS.

SUPPLEMENT TO
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JUNE, 1908

The Canadian Architect and Builder

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ILLUSTRATIONS ON SHEETS.

Competitive Sketch for Presbyterian Church, Vancouver, B. C.—Arnold Woodroofe, A.R.I.B.A., and C. S. Wickender, Associate Architects.
St. Stephen's Church, Winnipeg, Man.—S. Badgeley, Architect.
House in Spencer Avenue, Parkdale, Toronto.—R. J. Edwards, Architect.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

House in Cluny Avenue, Toronto.—S. H. Townsend, Architect.
Statue in Queen's Park, Toronto, of John Graves Simcoe, First Governor of Upper Canada.—Walter S. Allward, Sculptor.

ILLUSTRATIONS IN TEXT.

Views and Plans of Leighton House.

CONTENTS

Editorial . . . 111-112
Notes on Travel.—II . . . 113
By the Way . . . 114
The National Association of Master Plumbers, Steam and Hot Water Fitters of Canada . . . 115
Fallacious Cement Tests . . . 116
Building Materials at the London Building Trades Exhibition . . . 117-118-119
Electric Blue Printing Apparatus . . . 120
Office Practice Regarding Hours and Vacation . . . 121
The Simcoe Statue . . . 121
Tile-Photography for Architects . . . 122
Preservation of Iron in Concrete . . . 122
On Architectural Nomenclature . . . 123
An Opportunity to be Improved . . . 123
Correction . . . 123
The Building Strike in Toronto . . . 125
American League for Civic Improvements . . . 126

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Large Scale Parqueterie.

It is usual in England to floor the passages of a church with stone or tiles and the seating areas with wood, in the form of herring bone flooring, composed of pieces of unfinished wood about 4"x18." The size of the pieces is the principal part of the excellent appearance of this kind of flooring and the fibrous appearance of the unfinished surface is the rest. It is suggestive also, from the ease with which it can be repaired in parts, of suitability for a building where the flooring may be worn out in some spots sooner than in others.

Walls.

There is nothing in the way of railing so satisfactory as the stone baluster. The difficulty about it is its cost, for in order to give it its proper effect it must be used in stretches of some length. In London where, if there are, as it is said, 3,000 miles of streets there must be at least 300 of garden walling; a cement baluster and rails are extensively used on the top of a low brick wall plastered with cement. The effect redeems a very plain street from dullness, is not unmanageably expensive, and yet does not look cheap. One never sees a fence of this kind in a state of deterioration, so that there is no reason to suppose it is not durable; indeed the evidence of other work in the same material would go to promise a durability as great as that of stone. Sometimes the baluster and rails are of terra cotta. Both are apt to appear alike in time, because of the London leases which exact repainting every three years.

Insurance Against Strikes.

It is stated on authority of the President of the National Manufacturers' Association of the United States that a Mutual Company is to be formed with the effect of insuring employers of labor against losses occasioned by strikes. The company will also aim to protect independent workmen, by establishing a legal department and prosecuting persons who may attempt coercion or violate the law. It is proposed to keep secret the names of the members, so that when a strike is instituted it will not be known whether the fight is to be with an individual employer or a powerful organization of the character described. There is a movement all along the line to curb the powers of the unions to demoralize business and restrict the freedom of employers to employ whom they please and of workmen to sell their labor to whom and at whatever price they may choose. The general public are a unit with

the employers of labor in demanding that means shall be found to prevent the continued disturbance of commercial conditions and interference with individual rights. Legislation with this object has recently been introduced and is now being considered by the Parliament of Canada.

Building Restrictions.

As the result of a recent attempt to establish a factory in the centre of a choice residential section of Montreal, Alderman Vallieres has announced his intention to introdnce a by-law defining the limits within which factories may not be erected. Such a regulation should be inforce in every city, and ought properly to be incorporated in the building by-laws. There should also be a clear cut provision compelling property owners to keep their buildings back a certain distance from the street line. Numerous cases might be cited in which for want of such regulations heavy losses have been suffered by property owners in residential districts. It should not be possible for a factory, a livery stable or even the back premises of an apartment house to abut against residential property, nor for the house owner to build a porch or other projection so near the street line as to deprive his neighbor whose house is properly placed of the view up or down the street to which he is entitled. It is to be hoped that if the Toronto building by-laws supposed to be now in process of revision, ever reach completion, they will contain a clause which will properly regulate these important matters.

Old Mantles.

There is in England a trade in old mantels. When old houses are broken up, these, and no doubt other fragments of detail, are collected by dealers and sold for incorporation in modern work. The paint is cleaned off thoroughly, and in that state it can be seen exactly in what condition the work is. A correspondent in London who has been examining some of the stock at the warehouse of Thos. Hall, 25 Great Portland street, London, W., suggests that some of these mantels ought to be imported into Canada. The price ranges from about $30 to about $60. At that price they are cheap; and, with cost of importation added, would be still worth while for those who can afford to pay for a good thing. Though old, the mantels that are offered for sale are not shabby. They are usually of good design, which was the origin of their preservation, and are fully ornamented; and, whether because there is a softening effect of age or that the work is hand work, the ornament is more pleasing than in new productions of the same model. It would be possible for a purchaser to get sufficient description or illustration of some of these mantels to make up his mind as to their suitability.

Peasant Art.

There was recently held, at the Albert Hall in London, an exhibition of Home Arts and Industries, the annual work of a society which exists to foster the production of various forms of art in the leisure hours of working people. When the movement first began there was a tendency to claptrap: hammered brass and other forms of unmistakeable hand production, valued more for the evidence of handwork—what is known as "the loving marks of the hammer"—than for any real beauty. Now, however, there are some excellent productions in the way of homespun cloth and other textiles, lace, tapestry, pottery, cabinet making and wood carving. All these are good and useful productions; the country is better off and the people who make them are no doubt better off, both mentally and in pocket, for their production. But the interesting thing for a bystander is to observe that there is not a trace perceptible of variation from the ordinary types of similar work produced in the ordinary way. The cloth is simply good cloth; the lace is, to the eye of a male man, like other lace; the tapestry might have been designed, and perhaps was designed, by some one of the school of Burne Jones; the cabinet making might come from Grand Rapids, Mich.; the wood carving is as imitative of old work as is the best architect's; the pottery alone and some of the metal work had a noticeable note of freshness.

London Leases

The tenant in London assumes risks which would be declined in any other town. Houses are let under what is called a "repairing lease." "Reasonable wear and tear," which are excepted, in our leases, from the tenant's responsibility, are what, in London, the tenant has especially to make good. In other words the preservation of a man's property from the deteriorating effects of time depends not upon his own exertions but upon exertions which he exacts from the temporary occupant. The consequence is that there is always a floating valuation going on outside of the lease. An incoming tenant may have three money questions to consider: The rent, the repairs the landlord requires before he will give possession, and a premium to be paid the outgoing tenant for improvements effected by him—this latter in the case of taking up an unfinished lease, which often happens, for leases taken under these conditions are usually taken for as long as possible and are often transferred while still running. On the other hand, before a tenant quits possession, an inquisition is made by the agent of the landlord to see if the tenant is leaving the property in the condition in which it ought to be left; if not, an estimate is made of the necessary repairs, the sum is extracted from the outgoing and handed to the incoming tenant. It is probable that it would be more exact to say that the sum is allowed the incoming tenant and extracted from the outgoing tenant if possible.

One effect of shifting repairs from the owner to the tenant is that, even when a row of houses remains entirely in the hands of one proprietor, the repainting of the different houses is done at different times and a row is effectually relieved of monotony. The repetition of the original tint (usually a very light colour) in different degrees of freshness is rather an improvement to the look of the row, having all the pleasing effect of cloud shadows on a range of hills.

The most serious result to the tenant, of such a lease, is that the consequences of undermined foundations, earthquakes, windstorms, etc., fall on the tenant, who does not therefore feel in a sound position unless he has capital, beyond his needs, practically sufficient to rebuild the house.

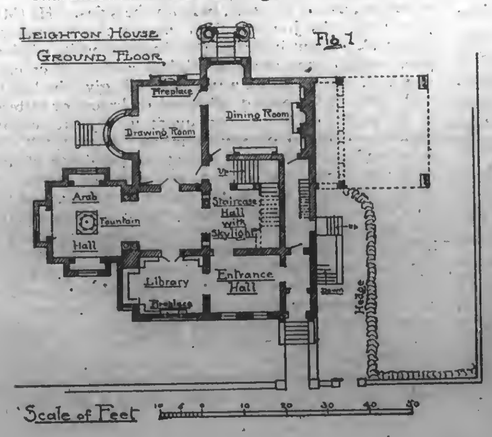
TOWER OF ST. PETER MANCROFT, NORWICH.
G. E. STREET, ARCHITECT.

NOTES ON TRAVEL.—II.

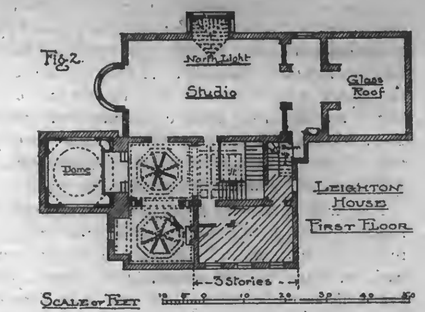
LEIGHTON HOUSE.

Lord Leighton's house has been pocured for the public by subscribers; and, under the management of a committee is open to the public. The floors are properly covered and there is a good deal of furniture but no knick-knackery. The walls are covered with chalk and pencil studies for his various paintings. These were also procured by the committee from Lord Leighton's heirs and elsewhere. They are well arranged in groups as pendants to a photograph of the painting which resulted from them, and form a valuable series of lessons in design for artists. But the house itself is the object of this study.

The house is designed for the interior. The exterior is not composed for display and would have little chance of being seen if it were. It is in the middle of Holland Park Lane, which is in reality a stable lane about 33 feet wide, with a cobbler's shop on one side of the entrance to it and the back of a livery stable on the other; one good house next to Lord Leighton's but retired in its grounds; a row of cottages opposite, two of which, as their signs declare, are inhabited by a clear starcher and a carpet sweeper; the rest of the lane occupied by studios of a modest kind, some of which are converted stables, and by stables which are still unconverted and in the gall of bitterness.

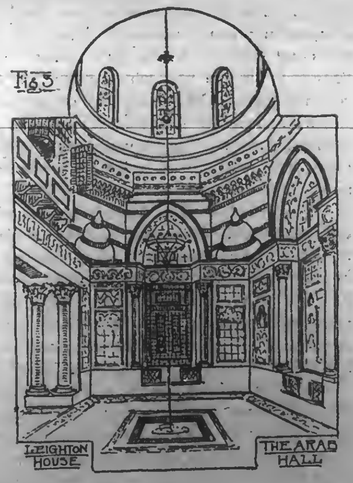


Once in the house there is no occasion to think of the approach, which is indeed partly justified already by its quietness. In London it is only necessary to be one remove from the traffic of a main artery in order to be quiet. There is no roaring trolley or ringing asphalt; the pavement is of square wooden blocks on concrete, and the intervention of a garden is enough to make its soft roar sufficiently remote. The front of Leighton House is desirably quiet and the rooms looking upon the garden behind, upon the north side of the house, are a model of peace and dignity.



The house is distinctly a house for entertainment. Lord Leighton was unmarried and lived alone. His bed room was in the shaded portion of the upper floor. This area is now set apart for the office of the honourary secretary of the committee and is not open to the public, but, from its shape and the arrangement of the doors it seems probable that the bedroom was the larger square to the east and that the smaller square beside it was a dressing room or bathroom.

The kitchen was in the basement, as is usual in London, and the servant's bedrooms on the third floor, over Lord Leighton's own bed room.



The special feature of the house is the Arab Hall. It is of course an exotic: the latticed windows are not needed to exclude the already subdued light of London, nor is the air so parched that a fountain is a first consideration for luxury; but, like many other exotics, it has a special charm from being a remove from the

ordinary. The real charm is however its perfection, the work, at the bottom, of the architect, Mr. Arichison. It is the proportion and balance of the design which are the real base of the beauty which the enamelled oriental tiles decorate ; but, together, they make a piece of work which seems to lack nothing of perfection. To sit in one of the wide window seats and let the eye rest on the harmony of the design while the ear enjoys the music of the fountain echoing in the dome is to enjoy perhaps as distinct pleasure as mere architecture can give.

There is no photogragp procurable of this hall, or indeed of any part of the house ; and in any case a photograph could not take in the upper part of the hall, which is included by the eye. A drawing may be made to suggest a little more in this respect but can do almost nothing in the hands of an unskilled draughtsman, towards giving an account of the elaborate decoration of the surface, even as regards the lines, and nothing at all to suggest its colour.

The Arab Hall is 17 feet square. The floor is of mosaic marble with a border of coloured scroll work round the edge and a black marble border round a basin of water, 5 feet square, in the centre, which, below the surface of the water is sunk in the form of an octagon with angles centered on the sides of the basin, and a semicircular sinking springing from each side of the octagon and about half a side in diameter. A pipe nozzle, projecting above the surface of the water, at the centre, sends up a stream, of about 1/16 inch in diameter, about 3 feet high. This falls back into the basin with a musical sound to which the echoing character of the hall largely contributes. The walls have a black marble dado up to the window sills, 2' 6" high. The windows are covered by lattices of Mashrabeeyeh work. The window bays are 9 feet wide by three feet deep, with angle columns of white marble (incorrectly shown in the plan as projecting into the recess). The column recesses are lined with light coloured marble an inch thick. The outer edges of the slabs are flush with the wall surfaces and form a boundary for the tiles which cover the walls. The columns have alabaster capitals carved with storks, which are reversed on adjacent sides and make symmetrical forms. The columns carry a flush frieze, about 2 feet deep, with a mosaic scroll, having birds and animals for the details. This frieze runs across the windows also. The frieze is finished with a 6 inch cove and fillet, with about half-inch projection from the frieze and quirked at the top of the cove. The wall spaces from dado to frieze between the columns is covered with old tiles, mostly of the 16th century, procured in Rhodes, Cairo and Damascus on different occasions. They may all be described as a rich blue and white. The blue has that mingling of green which is usual in oriental work. The tiles came from different places and are probably the work of different generations ; each portion of wall has at least two subdivisions of pattern, and no two portions of wall are alike ; but the harmony both of design and colour is perfect. The windows have pointed arches faced with dark marble, moulded : the soffits are mosaic, similar to the frieze. From the frieze spring squinches, if they can be so called, like inverse and inverted pendentives, with a delicate outline of many curves which carry a truncation of the hall with great neatness. The truncation is further extended by a complicated Arab cornice, of many ogee arched projections, until they become side of an octagon upon which the dome sits. This part of the wall is all in porcelain or enamelled tile ; white, with wide blue bands which cross the squinch forms so as to exhibit their modelling. The dome has moulding in colour at the bottom, a dull gold or yellow surface and eight circular headed lights filled with genuine Persian coloured glass, very deep in colour. Over the frieze where it crosses the entrance to the hall (a marble beam on columns) is one of those projecting lattice windows, a piece of old work, brought from the east. This looks into the hall from the hall in the first floor.

A description of the Arab Hall would be incomplete without some notice of the value which the unlighted middle hall gives to both this and the well lighted staircase.

W. A. LANGTON.

(To be continued.)

BY THE WAY.

The field is already so full of specialists and so-called experts that the functions which ought to belong to and discharged by the architect, are becoming less and less clearly defined. Yet there is apparently a disposition to specialize still further. The recommendation has recently been made that service of the "lighting engineer" should be procured to determine the character and location of lighting fixtures which should be employed in a building, their effect upon the decorations, color of light to harmonize with fittings, disposition of occupants of rooms and character of employmen therein, expense of installation and maintenance, burners available and supplies or repairs for the same, etc., etc, Now if the architect who plans a general scheme be not competent to deal with the details thereof, it seems to me he had better abdicate entirely, and hand over the whole business to the "specialists." Within proper limits the latter are doubtless a distinct aid to the architect, but if success is to crown the work, there must not only be expert knowledge in the various departments, but also a master mind to plan, supervise and harmonize the whole undertaking.

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According to the Meriden Journal, M. M. Jones, (nothing extraordinary about the name) an architect of that city, has invented a measuring rule that may almost be said to be capable of measuring anything, anywhere, and of any size, beneath the skies. He (Mr. Jones) says the Journal: Has taken a cheap, common rule, and, without increasing or diminishing its original size, weight, appearance or original usefulness or convenience, has produced a rule that will give the length and levels of the ends of all kinds of braces or rafters. It will square off a board or square and lay out a cellar, make an octagon or square mitre. It will tell the height of any building or elevation, the depth of any valley or chasm, the width of any street or stream, or both. Anchor a boat in the middle of a river, and the rule will tell how far it is from shore ; a roofer can tell the dimensions of any roof while standing on the ground ; it will measure anything in sight, whether in reach or not ; it will give the length of any straight or slanting line, it solves all the problems in geometry and trigonometry the mechanic is ever called upon to solve. The improvement can be attached to all kinds of rules in use, whether of the French or English systems, and to a new rule while making. One cent per rule will pay the cost of the improvements ; to a rule already made it will cost two cents a rule.

THE NATIONAL ASSOCIATION OF MASTER PLUMBERS, STEAM AND HOT WATER FITTERS OF CANADA.

The eighth annual convention of the above Association opened in Forester's Hall, 505 Craig Street, Montreal, on the 2nd of July, The President, Mr. F. Powers, presiding. The president in his annual address stated that the relations of the master plumbers with the manufacturers and supply firms were of a friendly, and on the whole, satisfactory character. The membership of the Provincial Associations was steadily increasing. New associations have been organized during the year at Sydney, and on the Island of Cape Breton. Attention was called to the necessity for the appointment of a permanent secretary and organizer to be paid a salary sufficient to enable him to devote his whole time to organizing and association business. Owing to the shortening of credits to 30 days by the manufacturing and supply firms, it was recommended that the plumbers also curtail credits to thirty days.

The report of Mr. Peter C. Ogilvie, vice-president, contained the following suggestion: "I think that in the interest of every one, no contractor should make a contract with any labor union, until such time as they become incorporated bodies. As it is now, a contract is only kept until such time as it suits them best to break it ; I sincerely hope that we will be able to get some practical suggestions from some of those present at this convention."

Mr. W. H. Meredith, vice-president for Ontario, urged the importance of organizing associations for every province, and as a proof of the advantage of so doing, referred to the fact that all the principal towns and cities in Ontario now had local associations, and that in Toronto 95 per cent. of the master plumbers are members of the local association.

Mr. James Farquhar, vice-president for Nova Scotia, referred to the fact that the Board of Health at Halifax is very strict in the enforcement of sanitary regulations, and that there is co-operation between the Board and the local plumbers' association in behalf of the enforcement of sanitary laws.

The President of the Montreal Association, Mr. T. O'Connell, referred in his report to the good feeling existing between the Master Plumbers' Association of Montreal, and the local Journeymen's Union. Reference was also made to the fact that the city plumbing by-law has been amended in several important particulars, one of which was that journeymen have now to undergo examination.

George A. Perrier, secretary, in his report also referred to the necessity for the appointment of a paid secretary who should reside at a central point, and be in a position to have at all times a thorough grasp of the affairs of the Association.

The President called attention to an Act passed by the Legislature of the State of New York and which is now in operation, having reference to government and municipal contracts. This Act had been revised with a view to its presentation to the Dominion government for adoption, and is as follows :

The people of the Dominion of Canada represented, do enact as follows :

Section 1. All specifications or contracts hereafter made or awarded by the Dominion, or by any public department or official thereof, for the erection and construction of buildings, shall be understood to embrace stone and mason work, carpenter work, painting and decorating work, plumbing, heating, electrical work, structural iron work, and roofing.

Section 2. The officer, board or commission charged with the duty of drawing specifications and contracts for the erection and construction of buildings for the Dominion, or any political or other sub-division of the Dominion, must draw separate specifications and contracts to cover the separate kinds of work referred to in Section 1 of this act, and they must be so drawn as to permit of unfettered bidding for and upon the separate branches of work to be performed.

Section 3. All contracts hereafter made or awarded by the Dominion, or public department or official thereof, for the erection and construction of buildings, are to be awarded separately upon the separate branches of work, as referred to in Section 1 of this act, to responsible and reliable individuals, firms and corporations engaged in the business of the kind to which the work to be performed belongs.

Section 4. No bid shall be received or accepted by the Dominion or any public department or official thereof, unless the party making the bid shows by affidavit that he is a citizen of the Dominion of Canada, and as a test of his fitness to properly perform the work bid for, that he has served an apprenticeship of at least three years at the line of work specified in his bid, or that he is a contractor in the particular line, and has had at least five years' practical experience.

Section 5. If any person, firm or corporation, to whom any contract is hereafter let, granted or awarded, by the Dominion or by any public department or official thereof, shall, without the previous written consent specified in Section 5 of this act, assign, transfer, sublet or otherwise dispose of the same, or any right, title or interest therein, to any other person, firm or corporation, the Dominion, public department or official thereof, as the case may be, shall be relieved and discharged from any and all liability and obligations growing out of said contract, and to the persons, firm, or corporation to whom be shall assign, transfer or sublet, or otherwise dispose of any right, title or interest in the same, and said contractor, and his assignee, transferee, or sub-lessee shall forfeit and lose all moneys theretofore earned under said contract, except so much as may be required, to pay his employes, provided that nothing herein contained shall be construed to hinder, prevent or affect an assignment by such contractor for the benefit of his creditors, made pursuant to the Statutes of the Dominion.

Section 6. All acts and parts of acts inconsistent with this act are hereby repealed.

Section 7. This act shall take effect immediately.

The proposed measure met with general approval, and a committee consisting of the President, past-president McKinley and the treasurer, Mr. Lamarche, was appointed to interview the Minister of Public Works

and the Ministers of all spending departments of the Government and urge upon them and upon the Government the adoption of this measure during the present session of Parliament.

The action of the manufacturers of soil pipe and fittings in deciding to discontinue, after the 1st of January next, the sale of light soil pipe and fittings, was endorsed.

The Committee on Resolutions suggested that clause 1 of the President's report be amended to read as follows: "That it be a recommendation from the National Association, that any agreement which local associations may make with the journeymen, should be ratified by the International Association of Journeymen Plumbers." On recommendation of the committee the other reports were adopted. The committee recommended that the revenue of the Association be enlarged by an increased per capita tax, thus placing sufficient funds at the disposal of the officers of the Association to properly prosecute the work.

The Executive Committee were instructed to place themselves in communication with the National Association of the United States to learn if it would be agreeable to that organization to have a representative of the Canadian Association attend its next annual meeting and to reciprocate by sending a representative to future annual conventions of the Canadian Association.

It was decided by vote that the next convention of the Association should be held in Toronto commencing on Wednesday, July 20th, 1904.

The following officers were elected for the ensuing year: President, Joseph Thibeault, Montreal; Vice-President, Robert Ross, Toronto; Secretary, H. A. Knox, Ottawa; Treasurer, F. G. Johnson, Ottawa. Provincial Vice-Presidents: British Columbia, John McKinley, Ottawa; Manitoba, A. J. Hammond, Winnipeg; Ontario, H. Mahoney, Guelph; Quebec, Joseph Lamarche, Montreal; New Brunswick, W. Watson, Moncton; Nova Scotia, Geo. Kinsman, Halifax. Chairmen Standing Committees: Legislation, E. B. Butterworth, Ottawa; Apprenticeship, G. A. Perrier, Halifax; Sanitary, James Hughes, Montreal; Essay, John Watson, Montreal.

A conference was held with representatives of a number of manufacturing and supply firms, when trade relations were considered. The plumbers pointed out the desirability of a Dominion organization of manufacturers and dealers in plumbers' supplies, so that trade differences might more easily be discussed and remedied. At a subsequent meeting of the manufacturers and supply firms it was decided to form such an organization.

A very enjoyable evening was spent in connection with the Annual Association Dinner held at the Windsor Hotel. In the unavoidable absence of Mr. Thomas O'Connell, President of the Montreal Association, the chair was occupied by Mr. Lamarche, having on his right the President of the Association and on his left Mr. J. S. Archibald, Vice-president of the Province of Quebec Association of Architects. The toast of "The National Association" followed the toast to "The King." It was proposed by Mr. P. C. Ogilvie, and responded to by the President, Mr. Powers. The President of the Toronto Association, Mr. R. Ross, proposed the toast to "The Montreal Association." Messrs. Joseph Laurier and Mr. Lamarche made suitable replies. Mr. W. H. Meredith proposed the toast to the "Invited Guests," which he said included the architect, the manufacturer and the journeyman. Mr. Mr. J. S. Archibald, Vice-President of the Province of Quebec Association of Architects, extended the hearty felicitations of that organization to the Master Plumbers' Association, and congratulated the latter upon the scope and usefulness of its work. Replies were also made by Mr. Howard, President of the Journeymen's Association, F. J. Travers, Peter McMichael, S. R. Brewer, A. D. McArthur, Alex. Robertson and J. L. F. Carron on behalf of the manufacturers. The toast of "The Ladies" was proposed in felicitious terms by Mr. Fred. Armstrong, of Toronto, and replied to by Mr. Harry Mahoney, of Guelph.

FALLACIOUS CEMENT TESTS.

Mr. D. B. Butler, Vice-President of the Society of Engineers of Great Britain recently read a paper before that body on the above subject, in which he referred to the uselessness of many of the tests now employed. In conclusion he stated that whilst recognizing the fact that exceptional circumstances require exceptional qualities of cement, he submitted the following standard specification as one which would ensure the delivery of a good sound cement suitable for the requirements of general engineering constructional work.

The whole of the cement shall be pure Portland cement, and shall conform to the following tests:

Fineness of Grinding.—To be such that when sifted through a standard sieve having 50 holes per lineal inch there shall not be more than one-half (½ per cent.) by weight of residue; when sifted through a sieve having 76 holes per lineal inch, there shall not be more than five (5 per cent.) of residue; and when sifted through a sieve having 100 holes per lineal inch, there shall not be more than 12 (12 per cent) of residue.

Time of Set.—A pat of neat cement gauged with the minimum of water at the normal temperature (60 deg. F.), and placed on a glass or other non-porous slab, shall not commence to set in less than eight minutes, or take longer than five hours to set hard.

Soundness, or Freedom From Expansion and Contraction.—A pat submitted to moist heat and warm water in the Faija apparatus for soundness at the usual temperatures—viz., 110deg. F. and 120deg. F. respectively, shall show no cracks or signs of expansion after 24 hours.

Tensile Strength. — Briquettes of neat cement, gauged with the minimum of water on a non-porous bed and placed in water 24 hours after gauging, shall carry an average tensile strain of not less than 350 lb. per square inch after three days, 450 lb. after seven days, and 550 lb. after 28 days from the time of gauging. Briquettes composed of three parts of standard sand to one part of cement by weight, treated as above, shall carry an average tensile strain of not less than 150 lb. per square inch at seven days and 250 lb. at 28 days from the time of gauging; but no matter how much greater strength may be developed at the earlier dates, both neat and sand briquettes must develop an increase of at least 50 lb. between each date.

Building operations in Vancouver, B. C., have been retarded by a strike for an 8 hour day of workmen in the sash and door factories.

New Street Entrance to City Arcades, Birmingham.

BUILDING MATERIALS AT THE LONDON BUILDING TRADES EXHIBITION.

Our representative in charge of our British office, 22 Great St. Helens, London, E.C., has sent us particulars of some of the exhibits of building materials and appliances shown at the Building Trades Exhibition held in London last month. Out of the large number of exhibits have been selected for mention those which were thought to be adapted for use in Canada and which might therefore be supposed to have an interest for the readers of this Journal. In interviews with the firms whose exhibits are mentioned below, our representative learned that it is their desire to obtain suitable agents in Canada with whose assistance they might be enabled to place their goods on the Canadian market and make their merits known in this country. The firms in question are of first-class standing, and manufacturers' agents in this country would do well to open correspondence with them. By so doing, either direct or through our London office, they would be assisting the present movement for closer trade relations with Great Britain and at the same time would no doubt establish for themselves profitable business connections.

Mellowes & Company, Limited, Corporation street, Sheffield.—This exhibit consists of a wooden structure entirely glazed on Mellowes' patent "Eclipse" system. The bars which support the glass consist of a steel bar entirely encased in a tin lead cover,

having webs on either side, which are rubbed down on to the glass (see sketch). Contraction and expansion are amply allowed for. No paint or asbestos is required, and no maintenance is necessary. It was learned that the glazing has been in use for 22 years, and is absolutely waterproof.

The Newellite Glass Tile Company, Limited, 139 Cannon street, London, E. C., exhibited their glass tiles, a perfect wall lining, with a clean impervious surface, unaffected by frost or weather, and absolutely free from the defect known as surface cracking or crazing. The nature of the key is a matter of the greatest moment, and if the tile is to be relied on, this key must be elastic, because the glass expands and contracts much more than the cement on which it is fixed. They claim the key of the "Newellite" Tile is of this elastic nature, enabling the glass to yield to the action of the cement to which it is affixed, while at the same time most firmly secured. The company are prepared to accept orders under the most exacting guarantee of durability, or on contracts of approved magnitude they will agree to a 10 per cent. retention for a period of two years from the completion of the work.

The stone exhibited by Messrs. Mackay & Davies, Cardiff, is known as the Blue Pennant. It is of a deep blue color and well adapted to all kinds of engineering, architectural, and surveyors' work on account of its even grain, exceptional solidity and great resistance to crushing. As regards weathering properties, it is very hard and durable and is largely used and highly spoken of for curbing, channelling and paving purposes. It can be supplied in large blocks sawn for steps, landings, sills, etc. The specific purity of the stone is 2.68 and percentage of water absorbed after 24 hours immersion is only 0.28.

The exhibit of Messrs. Josepb Place & Sons, Limited, Darwen, consisted of white, colored and salt enamelled bricks. The white glazed bricks have a heavy glaze with a perfectly even surface and are in this respect specially noticeable. The colors are in great variety, every shade of color being exhibited and it is now possible to match almost any color that may be desired. The salt glazed bricks are especially noticeable because of the richness of the glaze and the uniformity of the coloring; these salt glazed bricks have now reached an excellence of quality which is seriously affecting the enamelled brick trade, and, which produce a wall having variety without shadiness as compared with the flat uniformity of enamelled bricks.

The Velvril Company, Limited, 29 New Bridge street, London, E. C., made an exhibit of Velvril paint which is said to contain no lead or linseed oil; it is supplied ready for use, is easy to work, quick drying, gives a smooth hard surface, is not affected by atmospheric influence, is elastic, durable, does not fade or blister, and is perfectly waterproof and non-corrosive. It is suitable for use on iron, steel, wood, cement, etc., also for all kinds of decorative work. Velvril priming paints and varnishes are specially prepared for use with the paint. The company would be pleased to receive applications for the Canadian agency.

Major & Company, Sculcoates, Hull, exhibit the effects of their wood preserving stain "Solignum" in a most effective manner. Their stall consisted of a model half timber house in an enclosure, a railing and gate in front separating it from the gangway. All the half timber work of the house was treated with the medium and dark shades of Selignum, and looked very well, these two shades being most suitable for this class of work. To exemplify its effect as a preservative, three post ends were exhibited which had been buried in the ground for four years. The post ends untreated with Solignum shows considerable rotting, whereas those treated with one and two coats were perfectly sound. Though largely used on all kinds of woodwork in England, there is believed to be still wider scope for Solignum in the colonies and other countries where timber buildings are more in vogue and where in consequence of the severe climatic conditions wood is more liable to perish. It is being used in South Africa and Australasia in ever increasing quantities and with great satisfaction. It renders wood impervious to the attack of the white ant, and is a reliable preventative against dry rot. There should be a great future for Solignum in Canada.

Messrs. Sissons Bros. & Company, Limited, Hull, showed on a screen some charming examples of wall decoration in Hall's washable distemper in conjunction with their white Japan paint. In these schemes of decoration the colors are of the utmost delicacy and bear ample testimony to the value of the distemper as a decorative material, to say nothing of its hygienic qualities, which are of course obvious. It is perhaps necessary to say that the distemper can be had in any color.

Newell Bros., 192 Grosvenor Terrace, Camberwell, London, S. E., showed specimens of their tiles and sanitary wall linings, including the opal glass tiles for which are claimed, as specialities, super-

tor thickness, permanent white backing, and ease of fixing. Mr. J. T. Newell the pateotee, is one of the pioneers of the glass tile trade, and has produced the opal glass tiles as a result of long and careful study. The firm, who are contractors to H. M. Government and the principal hospitals, handle all kinds of sanitary ware and hospital fittings, and specialize on thick opal white microbe proof wall linings and slabs. Newell Bros. have a large export glass tile trade, and are selling in millions a very cheap and good glass tile.

Stanley Bros., Limited, Nuneaton, had on exhibition the following list of goods manufactured by them: Glazed bricks—brown, grey, granite, white and coloured; glazed sinks, brown and amber; glazed socket pipes and connections; terra cotta, red and buff; chimney pots—red, buff and salt glazed; roofing tiles—plain and ornamental; semi-encaustic paving tiles—plain and ornamental; red and blue ridges, finials and ventilators; blue pressed bricks, copings, garden tiles, and ventilating bricks; red, blue and buff Staffordshire quarries, glazed and unglazed malt kiln tiles; stoneware conduits, troughing, etc.

The Cloisonne Glass Co., 66 Berners St., Oxford St., London, W. The manufacture is called "Cloisonne Glass" and we cannot do better than quote the description of the inventors, and the logic of its name "Cloisonne." On a plate of glass of any texture or colour, the design is executed in thin metal strips or cloisons in precisely the same manner as in the older industry, but in the latter case a copper plate was used as the foundation upon which the strips were arranged. The design having wrought out to the required point, the cloisons are permanently cemented in place. The spaces between the cloisons are then filled in with small particles of glass of different textures or colours to carry out the design. The whole is then cemented to the transparent backing by a translucent material; a second sheet of glass is hermetically cemented over the work, and neither temperatures, nor climatic influences can affect it further. Most artistic effects are thus produced, the colours being radiant with light and valuable when seen through or when looking upon them. Portions of the glasses may be left clear and thus a beautiful contrast effected.

E. Turner & Sons, Penarth Road, Cardiff, exhibited samples of the different stones they quarry, namely, grey and blue Forest of Dean stone, Tintern Abbey stone, Farleigh bed bathstone, Corsham bed bathstone, Corngrit bed bathstone, also the red St. Bees stone, for which they are agents.

Darwen Sanitary Pipes Limited, Darwen, Lan., exhibited samples of large pipes, consisting of 36", 30" and 24" diameter sanitary tubes in 3 ft. lengths, also sample of an ordinary 18"/6" street gullies 4 ft. deep, and samples of special channel interceptors, and yard gullies. This firm make a specialty of pipes of large diameter, and their works are exceedingly well equipped for turning them out in large quantities and first-class quality, their raw material being most suitable for 21" pipes to 36" diameter.

F. McNeil & Co., Lambs Passage, Bunhill Row, London, E.C., exhibited asphaltic roofing felt for exterior roofing, bituminous or inodorous felt and sarking felt for lining slate, tile and metal roof, and for lining corrugated iron buildings.

Colledge & Bridgen, Wolverhampton, are sole licencees and manufacturers of Fisher's patent window attachment which has been designed with the object of preventing the numerous accidents frequently occurring when cleaning widows from the outside. Fisher's patent fittings are neat, easily fixed and cheap, and can be applied to new or old sashes. They allow the sashes to slide up and down in the usual way, and also to be opened into the room for cleaning and other purposes.

Messrs. B. & S. Massey, Openshaw, Manchester, exhibited an extremely useful drawing desk for the especial use of architects and other draughtsmen. The board is so constructed as to allow the user to keep in a perfectly upright position or adjust the desk to meet his own wishes. The table which is part of the outfit is constructed to hold conveniently any designs the architect may have or whatever size they may be. The whole apparatus is handy, neat looking and should be a useful adjunct to a designer's office.

The Marmorite Artistique Syndicate, Ltd., 154 and 155 Salisbury House, London Wall, E. C.—This firm's exhibit of Marmorite was much admired at the Building Trades Exhibition. The material is a splendid substitute for marble, can be made to any design and in any colour; and is specially suitable tor public or private buildings, luocheon rooms, lavatories, advertisement tablets, shop-fronts, etc.

The Crystalline Co., Ltd., The Platts, Stourbridge, exhibited snow white, opaque colored, porcelain opal, overglaze, and semi transparent tiles—A new product manufactured from porcelain opal with a "grip" or "key" back to enable it to adhere perfectly to cement.

An effective exhibition of "Mezotil" a new and attractive mural decoratioo, was shown by the London Tablet Co., of Sydenham, whose proud boast it is that their product is the result of a combination exclusively Englisb, namely, that it is made in England with English capital and by English labour. This wall covering consists of sheets of zinc of the normal size of 3 x 2 feet, enamelled and decorated in various styles, the designs hitherto employed being chiefly in imitation of tiles. As a clean, bright and inexpensive wall decoration this material deserves more than cursory attention. It is of course non-absorbent and vermin-proof.

The Permanent Decorative Glass Co., Lancaster, Manchester, and at 36 Basinghall St., London, E. C., exhibited examples of their well-known "Finrite Opal" tiling and metal wall decorations, including a large variety of pattern tiles, imitation marbles, granites, ornamental borders, &c. They had also a tiled partition showing several excellent examples of their work. The advertisement of this company will be found in the British section of this paper.

Mr. W. E. Farrer, Cannon street, Birmingham, exhibited an automatic alternative distributing apparatus for small bacteria beds, such as are required for use for large public buildings, as asylums, isolation hospitals, barracks, &c. Distribution is provided for by means of an automatic tipper discharging alternately into two sets of light perforated cast-iron channels supported about 1 inch above the filtering medium. Torfit urinals, by the use of which flushing is rendered unnecessary; an improved apparatus for flushing sewers, closets, etc.; a patent lattice-gear penstock or sewerage valve, a rust-collecting chamber for the base of sewer ventilating columns, &c.; and a selection of his sluice, air and other valves were also shown.

Messrs. Mather & Platt, Salford, exhibited a model of their automatic mechanical sewage distributor which, according to the analytical report by Inspector Leigh, gives admirable results. A model may be seen here of their patent gravity filter, which consists of a large circular iron tank, open at the top, and resting on a cast-iron chamber in which the filtered water collects before its discharge through the outlet-valve. The collecting-chamber is separated from the filtering-tank by a dished iron plate into which a large number of brass nozzles of special design are screwed, the object of which is to insure the effective use of all parts of the quartz bed during filtration, and a proper distribution of the water used for washing out. On this plate rests the quartz bed in graded layers, passing from the coarsest at the bottom to the finest at the top. The filtering-tank is fitted, at a few inches above the surface of the quartz bed, with an annular channel communicating by a number of openings with the tank, and into which open the inlet-valve for unfiltered water and the wash-out discharge valve. This annular channel affords a free outlet for the wash-out water, and is a marked improvement on any former arrangement, there being nothing whatever to impede the free discharge of the wash-out water. A third model represented the Archbutt-Deeley water-softening apparatus, all the mechanical operations in connection with which are very simple, and the labour involved light.

Messrs. Geo. Jennings, Ltd., of Lambeth, arranged a number of their well-known sanitary appliances, including some admirable specimens of fitted baths. These are shown in many forms and styles of decoration. A large variety of closets were also shown, including the "Century Syphonic," an ornamental as well as useful adjunct to which is the semi-circular porcelain flushing cistern, which advantageously replaces the old and somewhat unsightly iron tank. A new bath valve, Jenning's patent duplex attracted a good deal of attention, as by its means the water can be supplied to the bath hot, cold or blended, while all fear of scalding the bather or spoiling the enamel through the inadvertent turning on of the hot water first is obviated. The exhibits here comprised urinals, housemaid's sinks, vegetable, salad, poultry, fish, and kitchen sinks, wash-up, bed-pan and slop sinks for hospitals, and other cognate items.

Messrs. Shanks & Co., of 81 New Bond street, were represented at two stands, and showed many of their well-known make of baths

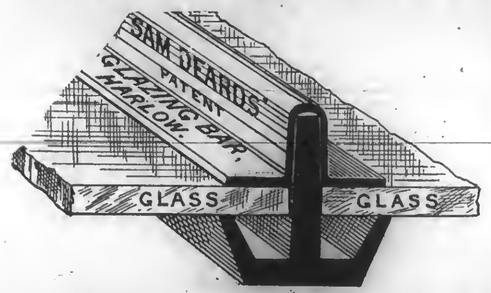
in the several varieties, as plunge, spray, canopied and tubular, in fireclay and porcelain enamelled iron; water-closets and supply cisterns, improved kitchen and scullery sinks, lavatories in vitro-porcelain and fireclay, &c.

"Velure," shown by Messrs. C. Chancellor & Co., Clerkenwell Road, is a new and perfected Japan paint, superseding varnish, with remarkable spreading, elastic and weather-resisting properties. It is sanitary and washable, and it is claimed that it will not crack, chip, peel, blister or fade. It is stocked in 120 colours and any shade can be matched. Samples of "Stripso," another specialty of this firm, were also shown. This is a paint or varnish remover which has satisfactorily withstood the tests of time and experiment, and been proved to be an efficient labour-saver.

At the stand of Messrs. Norton & Gregory, (Westminster Palace Gardens) was shown a new black-line process for the reproduction of architectural and engineering drawings, &c. The results produced by this process can only be characterized as admirable, every line being perfect and the colour not less so. Drawings can be reproduced on paper or linen as may be desired, and the reproductions can be coloured as readily as the drawings. In addition to the beautiful appearance of the prints, this process possesses a great advantage in the rapidity with which the work can be turned out as compared with other "black-line" processes. We may add that Messrs. Norton & Gregory undertake architect's perspectives, which they execute from plans and elevations.

Ripolin, Ltd., 110 Fenchurch Street, E. C., London, showed results of applications of paint to various materials. A conspicuous object at this stand was a panel delicately tinted in flat Ripolin, the effect of which was eminently artistic and pleasing. Ripolin, Ltd., are introducing a new filling, which they strongly recommend for use with Ripolin, whether glossy or flat, for which it prepares a beautifully smooth, hard surface to which the finishing coat can be applied to the great economy of the latter.

Sam Deards "Patent Glazing" for all classes of glass roofing was extensively shown at this Exhibition. We have pleasure in showing our readers an engraving of this glazing bar, for which the advantages claimed are: Its simplicity, cheapness, and durability, and best of all from a colonial point of view the possibility that it can be easily fixed by builders, plumbers, or even unskilled labor. This steel glazing bar with lead cap is made in three sections, C. E. and F., and the steel bars can either be



enamelled, galvanized or lead covered. The same can be supplied all ready for fixing, cut to any desired lengths and easily packed for shipment. Agents are wanted in Canada for this glazing, and full drawings, prices and samples will be forwarded on application to Sam Deards, Limited, 34 Old Broad street, London, E. C., or Victoria Works, Harlow, Essex. There is also a special system for glazing on wond rafters and for fireproof roofs where no wood-work is required; all glazing bars are made "self-locking."

The Rhodes Patent Sash-Hanging Co. had an extremely interesting exhibit of a valuable invention for raising the heaviest sashes instead of the ordinary and usually inefficient smooth-grooved pulleys, worked by sash-cords, chains or wires. This invention enables the largest and heaviest of sashes to be opened and closed by a child. The fittings consist of a cog-wheel or teeth-pulley and steel chains, which are fixed to the sash and frame in the usual way. The chains are chemically treated to prevent rusting, and there are no intricate parts to get out of order.

The Warrington Bond Iron Syndicate, Ltd., of Manchester, exhibited their patent wall-tie. This is a particularly strong and effective tie, and the fact that upwards of five millions of them have been supplied, shows that it is rapidly coming into favour. There are three varieties, one for cavity work, one for solid work, and a special flat tie which may be used either for cavity or solid work.

Messrs. Candy & Co., Ltd., Newton Abbot, showed a large selection of glazed bricks of various descriptions, but of uniformly excellent quality and colour, granite vitrified paving bricks and channels, buff architectural terra-cotta, stoneware sewerage pipes, gullies, interceptors, &c.

NOTES.

Reports from St. John, N. B., state that never since the time of the great fire in that city has the building trade been so brisk; the supply of competent artisans is far below the demand.

The recent building strike in New York tied up $200,000,000 of capital and occasioned a loss in profits alone of $8,000,000 to the contractors and $13,000,000 in wages to the workmen.

On competion of their contract for the building of the King Edward Hotel, Toronto, Messrs. Illsley & Horn, gave an informal dinner to the sub-contractors and foremen on the different departments of the works.

The police magistrate of Toronto recently imposed a sentence of ten days in jail upon two workmen convicted of having assaulted another workman with the purpose of compelling him to give up his employment. In imposing sentence the magistrate remarked: "It's no use putting a fine on these men," their union will pay it, and it will not be a sufficient deterrent."

The fire loss of the United States and Canada for the first quarter of this year was materially below the average of the same period in recent years. The records of the New York Journal of Commerce place the losses for the three months ended March 31, 1903, at $39,164,800, or $9,000,000 less than in the first quarter of 1902, and $6,500,000 below the corresponding period yf 1901. The March fire losses were unusually light, amounting to but $9,907,000.

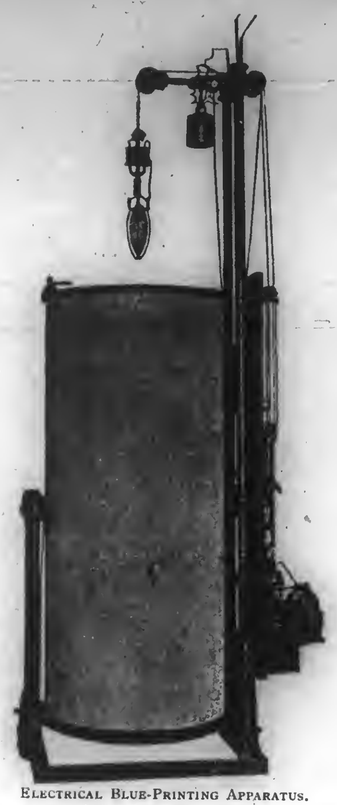
The British Vice-Consul at Lille reports that the violent campaign against the use of white lead for painting has severely affected this industry, of which Lille is the principal French centre; it is very doubtful, he adds, if white lead can be effectively replaced, various substitutes hitherto failing to give satisfaction. Largely increased importations of oxide of zinc, and introduction of a new product called "litophone," suggest that other countries, including the United Kingdom and Germany, quite as interested in sanitary questions as France, profit by the anti-white lead campaign to the detriment of the French producers.

There are three methods of curing chimneys which do not vent well, applied by Count Rumford and all smoke doctors since his time. The first is lengthening the chimney at the top, this increases the quantity of heated air in the chimney, and gives more power or head by increasing the difference between the weight of the air per foot, in and outside of it; the second is contracting the chimney at the throat; this increases the speed with which the heated air passes through it, and gives a heightened initial velocity to the smoke when beginning in its course up the chimney. The third is when there is a deficiency of air in the apartment to feed the flame and blow up the fire, putting ventilators into the sides of the apartments, or into the windows or doors.

A writer in the London Builders' Record gives the following method of removing grease spots on Watman drawing paper:—First remove as much of the grease as is possible by placing the drawing between sheets of clean blotting paper (preferably white) and ironing the spots with a moderately-hot flat iron, constantly changing the position of the blotting paper so as to expose a fresh unsoiled place and continuing this until the ironing no longer causes any discoloration. Then, if it is required to still further discharge the grease, take fresh blotting paper beneath the drawing, and, away from light or fire, pour over the spots benzine, which, as it oasses through the paper, will carry the grease with it. It may be necessary to repeat the latter operation several times before complete success is attained; and be sure and get benzine (syn. benzol) as benzoline is often solp as benzine.

ELECTRIC BLUE-PRINTING APPARATUS.

The importance as well as the general utility of the application of electricity to blue-printing appeals to every architect, engineer and draftsman, to whom the



ELECTRICAL BLUE-PRINTING APPARATUS.

production of blue-prints with the best of solar facilities has doubtless often been vexatious.

The dark and cloudy days of winter, as well as the rainy days in the summer and at all times during the year when the light is poor, smoky or irregular, makes the advantage of having an electrical equipment of great benefit to the possessor. The accompanying illustrations show one of the latest and most advanced types of machines for printing by artificial light.

The apparatus consists of a cylindrical printing frame, composed of two heavy curved plates of glass, bedded in soft material in an adjustable, though rigid, frame, together with two tubular uprights which support the arc lamp and automatic drive mechanism. This drive operates the lamp, having means for lowering it through the cylinder and then automatically raising it again to its former position.

The cylindrical frame revolves on trunnions, so that it can be swung to a horizontal position, which is the most convenient method for inserting or removing tracings and paper from the frame.

In operating, the cylinder is revolved to a horizontal position, and the tracings and sensitized paper are placed around the outside of the cylinder, being confined by stout canvas covers which are drawn tight by turning a lever, thus ensuring perfect contact between tracings, sensitized paper and the glass. The cylinder is then swung to the opposite horizontal position and the same manipulation repeated, after which it is returned and locked in vertical position and is ready for printing.

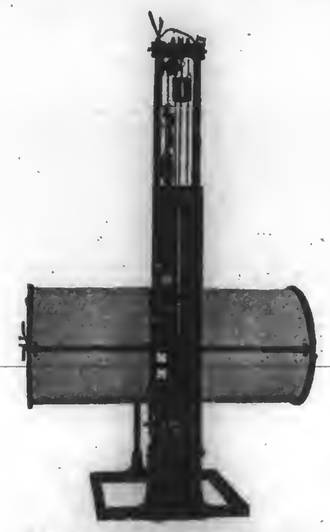
By simply touching a lever the arc lamp starts in its descent through the centre of the cylinder at a speed which can be regulated to suit the sensitiveness of paper employed. When the lamp has reached the lowest point of printing surface, it automatically reverses its motion and quickly returns to its original position above the cylinder.

The characteristic features claimed for the apparatus are as follows :

The machines are self-contained; no bracket or pulleys on wall or ceiling are required.

The automatic drive mechanism for raising and lowering the lamp is a novel, ingenious and reliable device. The downward movement of the lamp is even and steady, and can be regulated at will, to take from five seconds to an hour, depending upon the degree of sensitiveness of paper used.

When the lamp has passed the printing surface, thereby completing the exposure, the motion of the lamp reverses automatically, and returns quickly to its original



ELECTRICAL BLUE-PRINTING APPARATUS.

position. No time is lost and no hand labor is required.

The limit of the motion of the lamp can be set according to the size of the prints to be made.

The arc lamps furnished with the machine are of a special pattern and the best adapted for the purpose, giving the highest actinic effect and a strong, uniform and steady light.

When an advertiser complains that his advertisement does not interest the readers of a paper, he might do better to change his ad-writer than to change his paper. The public is anxious always to be interested, and if the advertisement fails to do it, the fault probably lies with the advertisement and not with the public or the newspaper.—PRINTERS' INK.

OFFICE PRACTICE REGARDING HOURS AND VACATIONS.*

The employees of our office petitioned recently for an extension of the Saturday half-holiday, which we have been giving during the summer season, to continue the whole of the year, and, upon making inquiries from a number of architects as to their custom, and finding it is quite general to give the half-holiday for the whole year, we granted the request of our employees, and anticipate that this additional leisure time will be as much appreciated by the members of the firm as by our assistants. It then occurred to me that it might be of interest to this association to know what is the general custom in regard to office hours, holidays and vacations, and therefore sent inquiries to a number of architects, and have replies from nineteen offices, which are sufficiently representative of the profession to indicate the general custom.

Three offices have a seven-hour day ; six have seven and one-half hours, and eleven have eight hours ; more than one-half, therefore, having eight hours as their working time.

Two offices begin work at 8 o'clock, one office at 8:15, twelve offices at 8:30 and three offices at 9.

One office has set no time for beginning work, the employees being expected to work eight hours, and those who come early leave early, and those who come later stay until their eight hours are completed ; the architect claiming a certain convenience in this for a small office, though, of course, it would be destructive to discipline in a large office.

The hours for closing are divided about equally between five o'clock and half-past five. There is an allowance of one hour for lunch in nearly every case.

In regard to Saturday half-holidays, six offices give such holidays during the summer months, twelve offices during the whole year and one office closes at 3 p.m. on Saturday, as I understand, for the whole year.

In regard to vacations, the custom seems to be universal to allow two weeks' vacation with pay to all employees who have been in the office a year or more, but not to those who have worked for a shorter time. It would seem that there ought to be a general uniformity of practice in all architects' offices in one city in regard to the matter of office hours and holidays and vacations. Apparently in Chicago the two weeks' vacation to permanent employees is generally recognized, and the Saturday half-holiday, which has been coming to be recognized more and more in the community, will doubtless be extended to take in the whole year by all architects, when they learn that the majority of offices are already granting that privilege.

In the matter of office hours, the preponderance is decidedly on the side of the eight-hour day, although there are enough offices that work for a shorter time to present a decided lack of uniformity. This is a matter which might be well discussed by this association, and perhaps a uniform custom could be brought about.

There are other matters of business management of our offices which could be taken up with advantage, as, for example, the question of overtime—as to the policy of working evenings, and whether there should be extra pay for such overtime. My own opinion on this point is that overtime should be avoided whenever possible, and that in most instances this can be done by the exercise of foresight. To work evenings for any length of time will certainly exhaust the energies and render the daywork less efficient, so that the gain is comparatively small and not in proportion to the additional effort, and that better results can be secured by urging every one to extra exertion during the regular office hours, at the time when there is a rush of business, and supplementing by additional help ; and that in the case of permanent employees there should not be extra pay for overtime. If every one knows that in case the work is allowed to drag along and is not done on time they must stay and work at night, it will be a stimulus to each one to finish his work during the day and thus avoid the need of overtime ; and when such an effort is insufficient, then the working force should be increased during the day, rather than to overwork by the addition of hours.

This brings up a point—that we often find it difficult to get extra help when we need it and would be glad to pay for it, and thus are forced to overwork ourselves and our employees. There should be some bureau of intelligence to supply draughtsmen on short notice. I have recently learned of such a bureau, namely, the Engineering Agency, in the Monadnock block, but this agency limits its work to supplying men for permanent positions. Now, probably the most frequent use that an architect would have of such an agency is to get one or two men to do tracing for perhaps not more than a week, and the fees charged by this agency are higher than one could afford to pay for positions lasting only a week. It seems to me that it would very properly be one of the operations of this association to have a bureau of information for architects' offices, and if our secretary is willing to undertake such work, I am certain a fee could be established that would reimburse him for the necessary expenditure of time. The object of this association is to help its members in every way possible, and it would certainly be a great assistance to our profession to where we can send on short notice and get extra help. At the same time such a bureau of information would be of great benefit to draughtsmen. One of the advantages of locating an architect's office in a large city is the facility with which skilled assistants can be found, and we could still further increase that advantage by such a bureau of information. If this work should be taken up by the association, its benefits would properly be limited to members of the association and thereby increase the value of membership.

*Paper read and discussed before the Chicago Architects' Business Association and the Illinois Chapter, A. I. C., April 14, 1903, by Normand S. Patton, architect.

THE SIMCOE STATUE.

The statue of John Graves Simcoe, first Governor of Upper Canada, a reproduction of which appears on our illustration page, unveiled May 27th, 1903, is the work of Walter S. Allward, a young sculptor of Toronto, and was won in competition from English, Scotch, and Canadian artists.

The Bronze is 9-6" in height ; the pedestal is of Stanstead granite, 10'-3" in height and was designed by the sculptor and cut by the McIntosh Granite Company.

The bronze casting was made by the Henry Bonnard Bronze Company, of New York.

TELE-PHOTOGRAPHY FOR ARCHITECTS.

We are indebted to the London Builder for information regarding the advantages for architectural photography, of using the tele-photo lens. By its use it is possible to take a piece of detail on a large scale at a height impossible with the ordinary lens. The following suggestions of the author may be useful to those who may care to experiment with tele-photography. He says: "All photographs of detail should be taken in diffused light if possible. If the sun is shining, sometimes an obliging cloud will obscure it for a time sufficiently long to enable an exposure to be made in diffused light. If a series of photographs is to be made of a large building or cathedral, begin work in the morning on the south side and go to the west as soon as the sun interferes; the north side may be safely left to the afternoon, when any exposures should also be made upon the east end. The final focussing of the tele-photograph should be made with the same stop in the front lens as that which is used for making the exposure. Do not take tele-photographs of detail against the sky if it can be avoided. Somewhat different conditions come into force when more distant views of buildings are the objects to be portrayed. In many cases sunlight will be helpful, especially if the sun is not too high and overpowering."

PRESERVATION OF IRON IN CONCRETE.

In the spring of 1901 the German Department of Public Works undertook a thorough investigation of the condition of the concrete slabs and the iron imbedded in them in a revetment wall built in 1890 in Berlin. The wall consisted of reinforced concrete slabs between beam posts, resting on piles cut off below water and held horizontally by back-stays, which is reported in a recent issue of the Zentralblatt der Bauverwaltung. The reinforcing consists of horizontal 3/8in. round iron rods in number depending upon the earth pressure acting on the slabs, and of vertical rods about 3-16in. in diameter. The vertical and horizontal rods are tied together by wire so as to form a netting.

To investigate the condition of the slabs and the iron imbedded in them, nine slabs were chosen which showed cracks and other injuries, and twelve slabs which had a perfectly good appearance. Thirty-two holes about 10in. by 10in. were chiselled out, completely uncovering the rods, and at all places also, where marked injuries were noticed, the concrete was removed completely from the rods. The horizontal rods were 0·04in. to 0·4in., and the vertical rods 0·4in. to 1in. from the faces of the slabs. In an injured slab three horizontal and two vertical rods were uncovered. The greater part of the upper horizontal rod was covered by a thin layer of rust, and the mortar, from the rod to the face, was destroyed. The two lower rods were free of rust. The vertical rods were somewhat rusty at several spots. In another injured slab, the uncovered rods, four horizontal and four vertical, were all equally rusty.

In a slab, which appeared on the outside to be in perfectly good condition, three horizontal and four vertical rods were uncovered. The two upper rods were rusted the same as in the slab first mentioned, but the lower rod was free of rust. The four vertical rods showed slight rusting at several spots. In another uninjured slab, all the rods uncovered, four horizontal and three vertical were found to be free from rust.

In a slab in the upper row, the concrete had scaled off for about 4in. above the bed joint, and short distances each side of the post. The uncovered rods were much coated with rust on the face. In another slab the concrete had cracked off near the lower edge for about 4in. A horizontal rod laid 0·2in. from the face had become loose, and was much rusted on the face. In still another slab, seven horizontal rods became loose because the concrete layer covering them had cracked off. The rods were much rusted. Three other slabs showed the same injuries. The concrete layer, which was only 0·12in. thick, had cracked off, and the rods which were laid bare began to rust.

Some conclusions as to the building of reinforced concrete slabs of this type and the arrangement of the imbedded rods may be based on these observations. Rods with incipient rust were found in a relatively great number in injured slabs and in slabs in good condition externally, but destruction of the concrete was found almost invariably only where the rods were near the external face. At such spots, having only a thin protecting layer of cement, it was found that the rod was much rusted on its front only while the rest of the surface remained clean. Apparently the injury to the slabs may have been caused partly by the improper location of the rods, even, when free from rust, and partly by the use of rusted rods. Wherever rods free of rust protected by a good layer of cement of 0·3in. to 0·4in. and more in thickness were uncovered, the slabs showed no injury. It was also observed that the mortar adhered less strongly to the rusty rods than to the rods free of rust. From the latter the mortar had always to be removed by the point of a hammer.

Since the greatest bending stresses take place at the middle of the slab, it will be well to bend the rods so that they will be near the centre of thickness at the supports and the requisite distance from the face in the middle. No greater difficulties will be encountered in tamping the concrete than are encountered with straight rods which have to be bent in at the ends because of the flanges of the I-beam post. No accuracy is required for the curve of the bent rod.

At the session of the Ontario Legislature which has recently closed, a bill was passed extending the powers of the Toronto Art Museum to enable it to accept large donations and bequests, borrow money and expropriate land. Mr. Byron E. Walker in urging before the Committee of the Legislature the passing of the bill, pointed out that the Association had already bequests and donations sufficient to enable it to proceed with the erection of an art gallery and museum as soon as the enlarged powers were secured. We may therefore expect to see this important project assume tangible form in the immediate future.

The traveller through the streets of our cities these early summer days, writes Mr. Barr Ferree, in the Architects and Builders' Magazine, will note a prodigious amount of building going on, but perhaps not much architecture. Although building should be architecture, unfortunately it frequently is something else. It is a pity that this should be so, for once a building is erected it is likely to stand some time, and if it is not truly interesting it had better not be built at all. The architect who writhes at unfriendly criticism should bear in mind that what is written may be lost and destroyed; his building, be it ever so atrocious, must stand, and stand before the public which is helpless to remedy it. The bitterest thing a critic ever said is mild and harmless compared with the ceaseless and unavoidable permanency of a building.

ON ARCHITECTURAL NOMENCLATURE.

Lovers of architecture should be glad that their love is not one of the "ologies," and is practically free from those Greek and Latin compounds which it seems to be the delight of scientists to introduce into the English language, says a writer in Building News. Though architecture is essentially a Greek word (as it is fitting it should be), it does not suggest the "specialist" which clings to the "ologies," and if we examine the architectural vocabulary, it is surprising how simple and elementary very many of the terms are. It is very pleasing, too, when we examine the relation between each feature and its architectural name to find that we can trace its origin, nature, and purpose through that name.

If such a vocabulary is made out, a very great number of the most common terms used in building will be found to be borrowed from natural forms, especially those of animals, and the physical system of the animal kingdom finds its counter-part in architecture.

Thus the very terms of the art show the noble principles on which the true forms of it is developed—they show both the laws by which a building stands, and the canons by which it is decorated. If the terms are belied or violated, their meanings, which remain, at once point out the barbarisms, and show up the falsehoods. Just as when we call a spade a spade, and someone chooses to call it a pitchfork, nobody is deceived who has any idea of what a spade really is.

Firstly, as to the laws of building in a universal sense. Starting with the solid foundation, the footings spread out to receive the walls, with their face and back. The wall is capped by the coping (Dutch cop = head), and where columns exist they have their capital (Latin caput = head). Further, the walls undergo the process of toothing. The vaults are completed with ribs, haunches, and crown; the roof has its hips, the rafters their heels. The window sills are throated. The very building, finally, has its wings. (It is interesting to note that the epithet of "wingless" applied to the little temple on the Athenian Acropolis is now understood by some to refer to the building itself and not to "Victory"— a theory which gains in probability on remembering the Erectheion in close proximity, which has so many wings).

Leaving the general structure of the skeleton of the building, we find among moulding such charateristic terms as swan's neck, bird's beak, dog-tooth, and also the wave moulding.

The last is especially pleasing as it is almost the solitary expression in architecture of the ocean. While it is true that flowers or foliage afford the quintessence of architectural ornamentation*, the sea contains such varied and grand forms and waves, that a "style" developed from wavecrests and ripples would be almost as fascinating and as equally magnificent as the most elaborate system of tracery or carving, with "foil", leaf, or "lobe" as a basis. The "wave-tracery" (suggested, no doubt, in the Flamboyant curves, but there literally developed from flames) is really a phase of Gothic yet to be developed and admired. Something far different, please, from Greek Fret or guilloche spirals, of which Ruskin wrote scornfully by pointing out that "into which the great Greek architect transforms the sea." But conceive how a wave would cast itself around a huge bell capital, and fall in dripping foam down the shaft! It is surprising that in such a water-city as Venice, with all the wealth and dexterity of Byzantine marble work on capitals and mouldings, no expression of their waterways and lagoons is conceived. The Japanese might do it, as surely they have yet to develop a style of architecture in which the peculiar qualities of Japanese art can exert their influence. The spirit of waves, as above suggested, is found very strongly expressed in the colour-print of Hiroshige and other artists. Perhaps few people have such a vivid way of catching the extract conventional forms of striking natural features. The same remarks might be applied to cloud forms.

Curiously enough, the parts of a ship do find their way into our architectural vocabulary. The keel moulding is characteristic, and there is cabling. On some American plans we lately noticed the delightful use of the word deck for a kind of verandah, and possibly cabin and saloon were originally taken from the ship. As there is no nobler art than shipbuilding, it is appropriate that its influence should be felt in architecture. The anchor is used in decoration, and Venetian masts will soon be adding to the gaiety of our street architecture.

In Greek architecture, if we may examine the original terms, we find the same association with life. The frieze was "life-bearing," and can anyone conceive a frieze more justified in bearing such a title than that of the Parthenon? Look, too, at the Caryatides, or "the women of Caryæ," supporting their eternal burdens of portico or roof. In the cornice we get the corona or crown. It is not quite clear why the pediment (i. e., foot) should be so called unless the idea was mixed up with that of the pyramidal form of a tripod acting as a foot. Then, again, there is the Greek moulding astragal, from one of the vertebræ of the neck.

Leaving architecture strictly, in carpentry and joinery the same nature of words holds good—witness dovetail (the French "swallowtail"), foxtail, herringbone, and tusk tenon.

We have by no means exhausted the list, and may mention bird's-mouth, bull-nose, feather-edged, tongue, dog-legged stairs. And, in conclusion, we may remind the weary reader of those delightful "heavenly twins" who put forth "flying buttresses" as signs of bad weather.

*In flower tracery we get the rose window. Ruskin has suggested a series of tracery devoted to every variety of flower, just as the Japanese, in their exquisite, natural flower decoration, devote one room to one flower.

AMERICAN LEAGUE FOR CIVIC IMPROVEMENTS.

The annual convention of the American League for Civic Improvement was held at Chautauqua, N. Y., July 13th to 18th, and the Ontario Association of Architects was represented by Mr. Wm. R. Gregg. There were conferences upon Rural, Village, City and National Improvement, at which representatives from many localities spoke, reporting a most encouraging year's work. Lectures were given by Mr. Clinton Rogers Woodruff upon "Municipal Progress," Mr. W. R. Eastman upon "Library buildings," Mr. Albert Kelsey upon "The Model City" and Mr. J. Horace McFarland upon "The Harrisburg Plan." Also two series of lectures were delivered, one by Prof. Chas. Zueblin on Contemporary Society and the other by Mr. John Quincy Adams on Art.

Mr. J. Horace McFarland was re-elected President and Mr. E. G. Routzchen is Secretary. An annual dinner and an afternoon's excursion on the lake contributed to the enjoyment of the delegates. The next annual meeting will be at St. Louis.

The Canadian League for Civic Improvement which was formed lately in Toronto is a similar organization.

CORRECTION.

We regret that a mistake occurred in the advertisement of the Henry Richards Tile Company appearing in the British Supplement in our May and June issues. The name connected with the Company's Sanitary Works should have been printed Edward Johns & Company, not Edward Innes & Company.

—THE—

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(With a Weekly Intermediate Edition—The CANADIAN CONTRACT RECORD).

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ADVERTISEMENTS.

Prices for advertisements sent promptly on application. Orders for advertisements should reach the office of publication not later than the 19th, and change of advertisements not later than the 5th day of the month.

EDITOR'S ANNOUNCEMENTS.

Contributions of value to the persons in whose interest this journal is published are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

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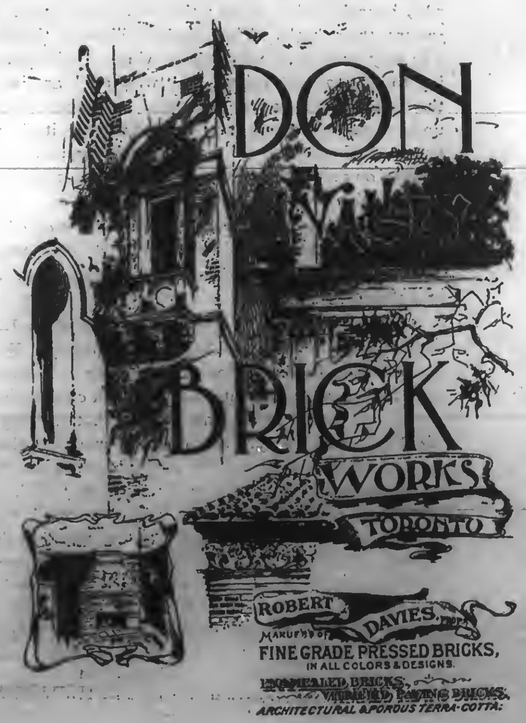
NOTES.

In the building of the City Hall of Philadelphia, a portion of the brickwork of the tower was laid up with cement mortar and another portion was laid in lime mortar. The work was faced with marble. As a result, wherever the marble facing was backed with brick in lime mortar, the marble facing crushed and spalled and had to be cut away and refaced. Wherever cement mortar had been used no harm came to the marble facing.



THE BUILDING STRIKE IN TORONTO.

The strike of the carpenters and builders' laborers inaugurated in Toronto more than two months ago has failed. The contractors offered the carpenters 32½ cents per hour, or within 2½ cents of their demand, an increase of 10 cents per hour above the wages they were receiving two years ago. This offer was refused and the resulting deadlock has continued ever since. The builders' laborers demanded 30 cents per hour and went out on strike rather than accept the contractors' offer of 27 cents. On several occasions recently the strikers sought conferences with the Builders' Exchange but were told that the employers had made their best and final proposition. In his last letter written but a few days ago, the Secretary of the Exchange intimated that that body had withdrawn its Committee and positively declined further negotiations. This brought matters to a climax, and the strike of the carpenters and laborers was declared off. The early termination of the painters' strike may now be looked for. On excellent authority it is learned that five hundred men are now at work in this trade, and that of this number about 460 are receiving 30 cents or less per hour. Under these circumstances there is not the ghost of a chance for the strikers to succeed in their demand for 35 cents per hour.

NOTES.

The master plumbers of Sydney, Nova Scotia, have recently formed an association.

Mr. W. J. Burroughes, formerly a well-known Toronto plumber, now of London, Eng., is at present on a visit to Canada.

Robert Snarr, a prominent contractor, of Toronto, died at his home in that city last month, aged 51 years. Among the important structures erected by him were the Home Life Building, McMaster University and the Mercer Reformatory.

The Trade Papers Publishing Co., High Holborn, London, Eng., has published Part I of a work by J. Petrie devoted to an explanation of the methods to be adopted for graining and marbling. The work which is to be published in fourteen parts, is illustrated by colored plates with explanatory notes.

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A DISCOVERY IN BRICK MAKING.

Mr. D. J. Acheson, of Niagara Falls, N. Y., claims to have discovered why the Egyptians used straw in the manufacture of their bricks. According to Mr. Acheson, it was not alone as a binding material, but because the tannin extracted by the soaking of the straw in water added greatly to the strength of the bricks. By treating clay with an extract of straw Mr. Acheson has shown a 50% increase in tensile strength and an increase of plasticity, with a decrease of shrinkage.

The clay is worked with water in which straw has been boiled. So little as one-half of 1 per cent. of tannin is said to develop a wonderful effect, the clay requiring 13 per cent. less water to make it soft. The maximum effect of the process and treatment, however, seems to be obtained by the use of 2 per cent. of tannin in a ten-day treatment. The treatment is merely keeping the clay wet with water in which tannin is dissolved, which can be done in vats.

Besides the above-mentioned 50 per cent. increase of strength in the burnt form, the clay in the sun-dried form acquires an increase of 350 per cent. in tensile strength.

As a result of this discovery Mr. Acheson has patented a combination of clay and tannin under the name of "Egyptianized clay.

AN OPPORTUNITY TO BE IMPROVED.

The meeting in Montreal next month of repesentatives of the leading Chambers of Commerce of Great Britain should prove an event of great importance to Canada. No effort should be spared to afford these representative business men of Great Britain opportunity to see every part of this Great Dominion, and judge for themselves of its resources and trade possibilities. The subject of prelerential trade within the empire, now the leading topic in political and commercial circles throughout Great Britain, will doubtless constitute one of the leading subjects of discussion at the Montreal Conference.

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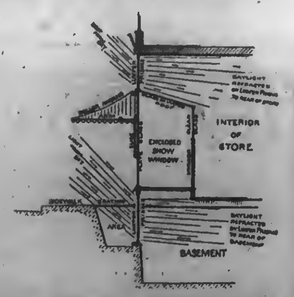

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St. Stephen's Church, Winnipeg, Man.
S. Badgeley, Architect.

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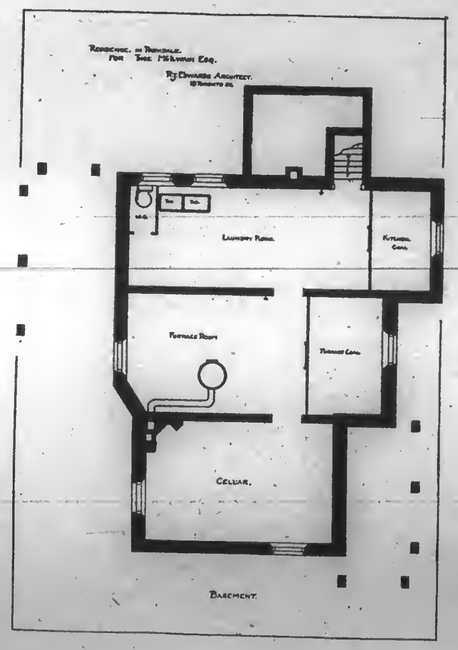

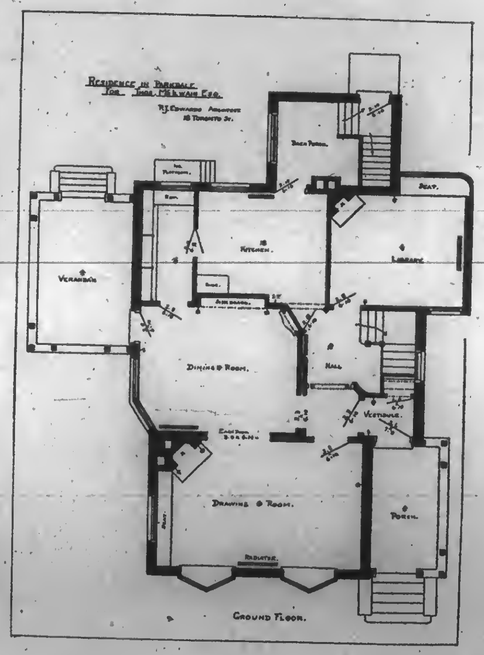

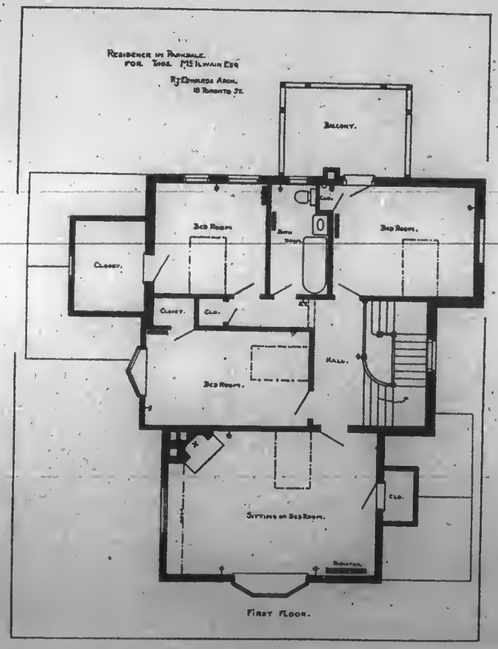

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JULY, 1908

The Canadian Architect and Builder

VOL. XVI.—No. 188. AUGUST, 1903.

ILLUSTRATIONS ON SHEETS.

Studio Residence for J. C. Pinkey, Hudson Heights, Que.—W. H. Watts, Architect.
Design for House at Collingwood, Ont.—J. W. Siddall, Architect.
Houses in Maitland Place, Toronto.—J. W. Siddall, Architect.
House in Jamieson Avenue, Toronto.—J. W. Siddall, Architect.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

New Retable, Embroidered Dorsal, Wings, Altar and Altar Frontal, Rochester Cathedral Lady Chapel.—A. H. Skipworth, Architect.
Buildings in Russian Section, Glasgow Exhibition.

ILLUSTRATIONS IN TEXT.

Views and Plans of Leighton House.

CONTENTS

Editorial	127-128	A Colossal Structure	136
Notes on Travel.—III	129-130	Proposed Standards of Fire Resistance	137
Some Lessons of the Recent Strikes	131	Failure in a Building Carried on Columns	137-138
Finishing in Woodwork	132	Notes	139
By the Way	132	Natural Light to Basements	140
The Portland Cement Industry	133-134	Sanitary Characteristics of Made Ground	140
The Dome	135	British and American Standards of Workmanship	ix
Architects' Fees in Relation to Fire Insurance	135	Legal	x
Absorbency of Clay as Affected by Drying	136		

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Fire Protection Engineering.

The Armour Institute of Technology, Chicago, has recently established a four years course in Fire Protection Engineering. Special instruction will be given three hours a week during the second year in the chemistry of fire protection, eight hours during the third and fourth years in fire protection engineering, and eight hours during the fall and winter terms of the fourth year in schedule rating, special hazards, underwriters' requirements and insurance practice.

Colour in Churches.

It is usual for writers about mediaeval architecture to speak with great sadness of the glories of the wall colouring, that time, assisted by whitewash, has caused to disappear. It is true that the small portions of frescoes that remain here and there have usually the peculiar softness of colour of a faded fresco. But it is not likely that the colouring was always so. And if it were—with the varieties of coluor and scale, the beauty, if there was any, must have been the beauty of a patch-work quilt; interesting perhaps in part, but queer as a whole. But as a matter of fact, what remain in the way of wall paintings are hideous in their grotesqueness, regarded singly, and could give no real pleasure, or be of real value, except to an antiquary. The church, when it is scraped down to the stone, is really more suitable and more pleasing. The present generation owes a debt of gratitude to the vandalism of the past. The best architectural colour is the colour of stone, especially of old stone. This is equally true of wood. Looking up at a perpendicular roof of carved oak beams, whitened on the outer surfaces of the mouldings and darkened in the hollows, one thinks with horror of the fragments of red and blue and gold which are said to be visible to close inspection. What if the whole roof were to be covered with them! The writers upon the church may regret, as much as they like, the loss of this ancient blaze of colour, but an architect is thankful.

Common Entrances.

A good arrangement, constantly to be met with in London, is a row of houses set back some distance from the road and having a common carriage drive. It is in fact a double road, as far as it goes; or, when both sides of the street have the same plan, a triple road; the public highway flanked by private entrances, which turn out into the public way at each end of the block and are divided from it by a railing of

some kind and a row of trees. In one case at any rate, this plan is carried through the whole length of the street and makes a handsome street of it.

This is nothing more than the ordinary spacing of town lots, so common in Canada; where each lot, whether the houses are detached or in rows, is too narrow to admit of a carriage entrance from the street up to the front door; and where the building line is set back so far from the street that, without a carriage entrance, any one arriving or departing in a carriage must cross some fifty feet of pathway, exposed to possibilities of rain or snow. In the case of the London house, the kitchen department is in the basement and the garden is on the interior side of the house, so that the only use of the set back on the exterior side is as a set back—to remove the house from the public way. That the space should be occupied by a private driveway is no loss but a gain. In our cities, as the rear is usually occupied by the service department and a yard, the set back in front becomes the garden and an airing place for the family; but there are occasional variations in which the London plan would be the thing to aim at.

In order to have the best effect of privacy and to keep the street well marked, a wall is necessary, or at least a railing. A plain, low wall is better than anything that can be made of wood, and even better than iron for purposes requiring clear distinction; but the most beautiful form of street wall—which is something that should define without concealing, and that, while serving its purpose, should also serve for adornment—is a low wall with a railing on top.

Winter Foliage.

There is great beauty in the mere trunk and branches of a well-shaped tree; and to have this before the eye in winter, especially when, seen through a window, the ramifications form, as it were, decorative pattern, running through the panes of glass and crossed by the sash bars, would be sufficient reason for having trees in a garden if there were no such thing as foliage. But when the time comes for the foliage to break out, it always seems to be a little better than we expected, and we look forward with regret to the time when it will fall again. As a matter of fact, the thing which particularly surprises us always is the abundance of the foliage. It is only by noting in one spring the extent to which the full sized leafage surpassed our expectations that we can be prepared for what to expect when summer comes again. This should be the cure for the discontent of winter; for the green gloom which we enjoy in summer would be an uncomfortable surrounding to a house in winter. But a green object that casts no gloom is as good in winter as in summer. What is wanted is an evergreen tree of some sort that does not grow too large and is not too funereal.

Japanese trees of this sort seem to answer every requirement except proof that they will stand our climate. They grow well in the north of England where it is very cold at times; yet it is not so much cold according to the thermometer as just beastly cold; and it is only thermometer cold that vegetation seems to mind, on the other hand, however, there is no protecting snow; but the sort of open winter that a few years ago decimated our hedges and climbers. Japanese ivy failed in that year when it was planted against a south wall; no doubt because its roots, when not protected by the cool covering of the snow, were beguiled by the sun to send up sap, only to have it frozen when the sun had passed. Ordinarily, Japanese ivy succeeds and the presumption is in favor of Japanese fir.

The peculiarity is, like other Japanese plants, a variegated foliage which relieves the gloom that is so unpleasant in other evergreens. A variety called Retinospora Aurea makes an excellent garden tree, in summer or winter. It does not grow too tall, has a fine close foliage, which makes good masses, but of a delicate texture. The tips of the leaves are nearly yellow for an inch or so, which brightens up the tree and gives its light and shade the *chic* effect of a piece of colored modelling which has had the tint wiped off the highest surfaces.

There is another Retinospora in which the foliage on the back part of a bough is of a very dark green, while the tips are of a very light, almost silvery, tea green. The effect of this is even more delicately beautiful than in the golden variety.

Table of Architectural Periods.

The following is a convenient table of architectural periods drawn up by an English architect:

A.D.				
1200	Early English.	Early English.		
1250		Gradual Change		
1300	Decorated	Gradual Change	..... Edward I	1272
			..... Edward II	1307
			..... Edward III	1327
1350		Gradual Change	..... Richard II	1377
			..... Henry IV	1399
			..... Henry V	1413
1400	Perpendicular		..... Henry VI	1422
			..... Edward IV	1461
			..... Edward V	1483
1450			..... Richard III	1483
			..... Henry VII	1485
1500		Gradual Change	..... Henry VIII	1509
			..... Edward VI	1547
1550	Elizabethan		..... Mary	1553
			..... Elizabeth	1558
1600			..... James I	1603
	Jacobean		..... Charles I	1625
1650			..... Commonwealth	1649
			..... Charles II	1660
1700				

The steel work in Chicago's new postoffice has been given three or four coats of graphite, one at foundry, one at building and two coats after erection.

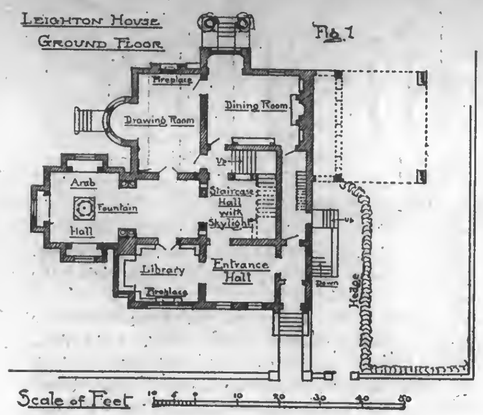
It is reported that the deposits of silica and gypsum near Truro, N. S., will be developed by a New York company. The ores will be shipped to the United States by water from either Bedford or Richmond, and from 100,000 to 150,000 tons a year will be mined and disposed of. Messrs. King, of New York, are said to be developing their plaster property at Hillsboro', Albert County, New Brunswick, which they have owned for a number of years. If the quarry turns out right it is expected that a large business will be done and their plaster mill in New York will be supplied directly from the quarry.

NOTES OF TRAVEL.—III.

Leighton House

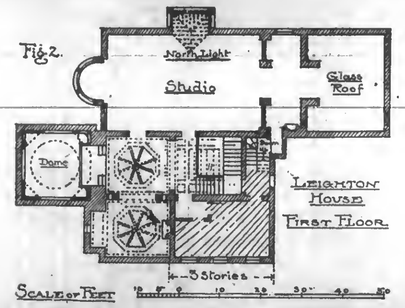
(Concluded)

The entire suite of halls is paved with mosaic work of marble. The openings, between the different parts, are finished with marble columns. This solidity is carried to the staircase, in which the steps of the first flight are of stone. This flight is contained by a stylobate wall, on which stand marble columns to take the staircase wall above; for the first flight of the stair is



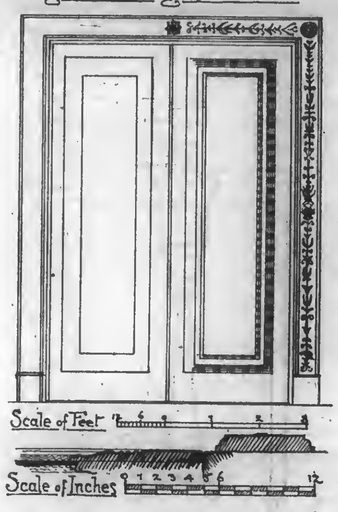
not within the staircase proper, but in a space beyond, which forms a sort of vestibule to the drawing room and dining room. The camparative retirement of the drawing room and dining room doors and of the bottom of the staircase, and the retirement of the latter behind a wall and a screen of columns, are good points in the plan; and an appearance of spaciousness and dignity is given to the hall by the added size and richness.

The drawing room depends for its interest upon the



bow in the centre of the west side. These windows open down to the ground, and from the window in the middle proceeds a flight of stone steps, leading to the garden. The boundary of the garden is not more than fifty feet in this direction. The direction of its greatest extent is to the north, where the limit is practically out of sight. The garden is large and has trees which intercept the sight of what is beyond it. The window on this side does not seem to have been specially designed for looking upon the garden—not downwards at any rate. The window is four feet wide and the stool is not less than 3'. 6" high. The fireplace is under it; and no doubt, in winter, the branches of the trees, as seen through the window, would form a good decoration over the mantel; better if the sashes were barred, which they are not. But, unless there was some idea of gaining wall space for large paintings on the east, with which a fireplace would interfere, the result does not seem to justify the arrangement. The fireplace opening is a semicircle, about 2' 6" in diameter, faced with white marble, inlaid with black in the form of an iris or rush-leaved plant, to decorate (rather thinly) the sides and spandrils. The mantel shelf runs into the window recess.

Fig. 4 Drawing Room Door.



The wall of the drawing room are painted a deep red; the ceiling is white, panelled with moulded plaster beams; the wood work is finished with shining, though not glossy, black paint. This is the manner of finishing the woodwork throughout the house. It is rather sombre, but dignified; and in respect of its shininess has this point in its favour, that the diffused light within doors is better calculated to give effect to mouldings designed to catch light than to those intended to make shadow. The incised work of the door architraves, in the drawing room, is peculiarly indebted to the way in which the wood is finished. A first sight of this incised ornament did not command admiration. Sunk patterns are but one remove from jig-saw work, and one might expect something better in Lord Leighton's "front room." But for some reason this ornament gave pleasure, and close inspection showed that the sinkings are not square, but pitched or curved. Stems are v'ed, but flowers and leaves are delicately and not monotonously curved and the shining surfaces reflect light like an intaglio. The flowers or rosettes, at the bottom, centres, and angles of the architrave are gilded. The panel moulding has a curious, delicate effect of being scored horizontally. Inspection showed that the mouldings are, at this member, subdivided by a number of small beads, which are run with a surfacethat waves on the plane of the face of the mouldings, producing horizontal bands of light and shade.

The Dining Room is trimmed in the same manner

as the Drawing Room but not with the same detail. The gilding is here carried into the baseboard of which the top member is gilded. A gilded moulding also finishes the bottom of the wall beam of the ceiling. It is not a picture moulding, but is evidently introduced for the line of gold: the pictures are carried on brass rods below. The ceiling beams, which are deep and heavily moulded, are coloured a deep red, something near crimson in colour. The walls are deep red also—a paper with a small pattern, a little lighter than the ground. The panels of the ceiling are white.

Lord Leighton evidently valued light from above. All the ceilings in the rooms, are white; and the distinguishing characteristic of the upper floor is the skylight in every ceiling. The staircase has a long panel in plaster, next to the wall all around, and the remainder is covered with a barrel shaped skylight. The staircase hall, with its columns, has, in consequence, all the effect of an open court; and the striking

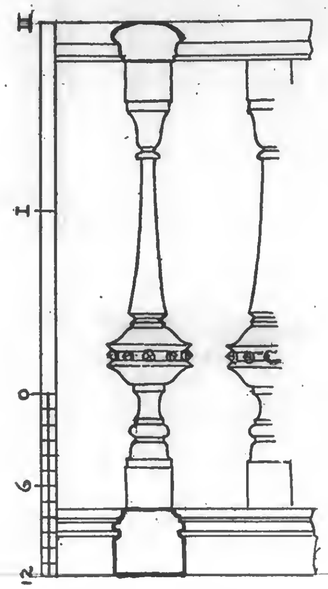


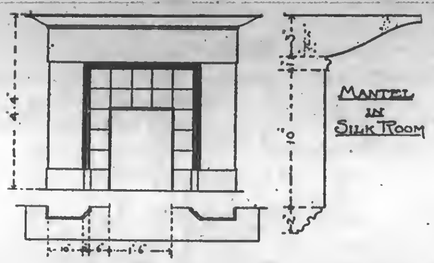
Fig. 6. Baluster.

balusters (which like the rest of the woodwork are a shiny black) are shown to advantage.

The remaining room down stairs—the Library—has black bookshelves, to the height of the window stools, round most of the walls. There is a fireplace in green marble, under the window again about as effectually tucked away out of sight as it is possible for a fireplace to be. Lord Leighton does not seem to have been of the same mind as the rest of the world who have adopted the Latin word for a fireplace, Focus, as the general term for an essential central point.

The most instructive feature in this little room of which the ceiling is as high as the other rooms on the floor, is its cornice, which must be of 3′ 0″ girth and has a good effect upon the proportions of the room. It must be remembered that there is a heavy base of book shelves.

Upstairs, the distinguishing characteristic is abundance of light. The double hall, between the staircase and the upper part of the Arab Hall, was evidently intended for the display of pictures. Each division has a skylight, in the form of an octagonal pointed dome, in the middle of the ceiling. The walls are hung with stuff of one colour: canvas of a bronze yellow in the northern division, and gold yellow silk in the southern. This latter division is dignified also with a marble

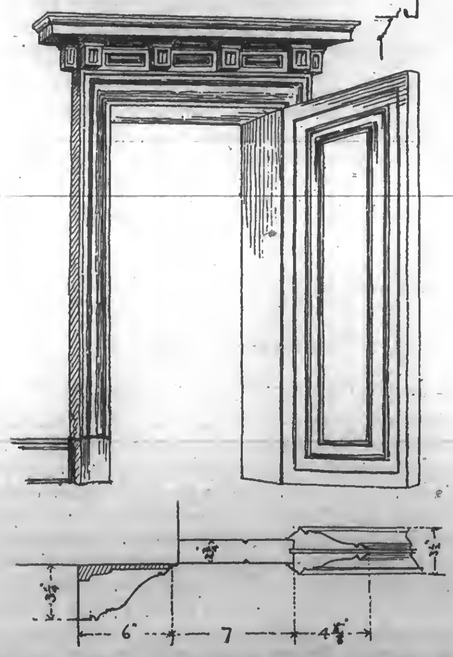


mantel, which, though simple, is worth a drawing. Marble columns supporting a plaster beam divide the spaces.

A couple of steps up from the floor is the level of the projecting lattice window which overlooks the Arab Hall. Latticed casements open so that one can look down into the hall; and the sound of the water, falling back into the basin, ascends from below. A large plant standing upon the platform between the steps, shows well under the skylight, with the lattice work as a background.

The Studio is of course the principal room of the

Fig. 5 Studio Door.



house in scale. Its finish is correspondingly bold. The main door in the centre of the Studio, which is shown

above, is made a central feature by the vigour of its detail. The secondary door, to the middle hall, is subordinated by its flatness. The shaded section shown at the back of the section of the architrave, in the drawing, represents the whole projection of the artritrave in this door; and its panel is similarly subdued.

The north light of the studio runs practically from floor to ceiling; and, being in the form of a projection, has a hipped roof, which is also in glass, giving a vertical light. The original studio ended with the gallery, which is now a passage room between the large studio and a later addition with a glass roof. This addition is carried on iron columns. The passage room is also clear of the ground, but not to the same height; there is a sort of well, (for the storage of canvases, etc., no doubt,) which extends a few feet below the studio floor; below this the structure is carried on piers. It seems a pity that this space was not included in the lower floor, where it would have made an excellent pantry, adjacent to the dining room, opening off the back hall. There is height enough for both a pantry and the storage well above.

Over the passage in the studio is a gallery, approached by a small stair—which should have been shown in the plan, at the north end, by the little window. A door at the other end of the passage, communicating with the back stair, was evidently the entrance for models. It will be observed that, in connection with this, there is a side entrance to the back hall, at the ground floor; apart from the kitchen entrance, which is by area steps to the basement.

W. A. Langton.

SOME LESSONS OF THE RECENT STRIKES.

As predicted last month the painters' strike in Toronto, like those of the other trades, has collapsed. The present season has witnessed the greatest conflict in the building trades that has ever been fought on this continent. The responsibility for the fight to a very large extent lies with the unions, whose demands were such that they could not be acceded to, and the employers were forced to organize for defence.

In Canada, public sympathy has largely been on the side of the contractor, the general feeling being that the workmen were pressing their demands too far. It is a pity that the men did not realize this fact before resorting to extreme measures and blocking commercial enterprises for the greater part of the year. They appear to have forgotten the old song which declares that "The mill will never grind with the water that is past." Neither will these strikers ever be able to give to the support and comfort of their families the money which they might have earned during the first three months of this season.

However, there is usually more or less silver lining to every dark cloud, and there is reason to hope that some benefits may accrue from the present disturbed conditions. The labor agitators have been discounted not only by the public but also in the eyes of the unions whose interests they are supposed to represent. In some instances they have been proven disloyal, even to the extent of asking for and accepting bribes to call off strikes which were instituted by their advice and direction. This should open the eyes of the unions to the character of some of the men who aspire to be their leaders and will no doubt lead to such a revision of regulations as will curtail the powers of the walking delegate. The unions have been taught that it is unwise to press demands which are out of relation to and not warranted by prevailing commercial conditions. To do so is to alienate public sympathy and court defeat. It may safely be asserted that an earlier appreciation of this fact would have saved the labor organizations connected with the building trades in Canada the very serious set-back which they have sustained.

The president of the International Typographical Union, in an address delivered at the annual convention of that body in Washington recently, advocated effort on the part of labor organizations in the direction of the better education of workmen and apprentices. He upheld the right of the employers as well as the workmen to organize, and suggested, correctly, no doubt, that such organizations might prove to be the mediums through which negotiations between employers and employees could more easily be conducted, and by means of which more satisfactory relations might be established.

If the labor organizations would approach the problem on the broader lines suggested in this address, they would find the employers ready to listen to their representations and to co-operate with them in securing necessary reforms. The interests of both classes are identical and should be so considered.

While the evil results of a long-sustained conflict are still so clearly visible this would seem to be an opportune time to look the situation squarely in the face and see if the policy of the past under which such strife and hardship have been suffered should not be superseded by one which would seek to improve the mental and mechanical ability of the artizan.

The effort to place all workmen on the same level, disregarding the widely varying standards of ability with which the Creator has endowed them, is one of the greatest errors of the union system as it exists to-day, and its abolition should form part of any system of reform which may be inaugurated. Workmen should be graded according to their ability and the rate of wages arranged to correspond.

Attention should be directed to devising means for improving the standard of workmanship, so that the presentation of a union card might be regarded as a guarantee of the competency of the workman. This important matter has hitherto received no attention whatever, but, on the contrary, employers have been made weary and disgusted by the repeated demands for shorter hours and more pay.

What is now wanted is a policy which will encourage workmen to make the most of the ability which God has given them, and teach them that by so doing they will achieve the highest measure of success in life, financially and otherwise. Such a policy would receive the approval and support of employers, would fit workmen to become themselves employers, and go far towards re-establishing the sympathetic relations which formerly existed between employers and their workmen, but which unfortunately have of late been in a measure destroyed.

A Chicago court recently decided that the owners of a building having a smoky chimney are liable for damages to persons whose property is injured by the smoke and soot. The award for damages was $1,500.

FINISHINGS IN WOODWORK.

By Fred T. Hodgson.

More attention is now being given throughout the country to the artistic finishing of houses and fine business structures, and more expert carving is done for the purposes named, the appearances indicate, than in the manufacture of furniture, which industry for a long time laid claim upon the greater share of this class of mechanical talent. The reasons for this may not be fully self-evident or patent, but it would seem that it is largely because the real value of hardwood in this direction had never been fully realized or understood in this country, and because, also, the real high art in decorative architecture is scarcely native to American ingenuity and talent, which is famous in other ways, since there are oriental splendors in building and interior display in the palace-like habitations of many a pagan, or uncivilized native, which would never have been deemed possible of execution by our own designers, however artistic their eye, or however deft their touch.

Processes and appliances for producing excellent results are known to many European workmen, in whose breasts the secret of such achievements is firmly locked. During the past few years many of these expert operatives in wood-carving have come to Canada, and their superior abilities have begun to manifest themselves in the wood manufacturing industry of this country, and latterly, to a very marked extent, so that a renaissance in wood-working may be fairly said to have resulted. The importation and employment of this class of talent led to a responsive sentiment in the the community, or such channels of it as evidenced a sufficiently refined or artistic taste to appreciate and encourage a sensible and utilitarian form of art, which was experiencing an important enhancement of its excellence, and now quite a pronounced stimulus has been given the industry of wood-work for house finishing.

Many of our native woods readily yield to the carver's tools and lend themselves to the artistic development of Canadian workmen, and many of our young native workmen have rapidly attained a state of proficiency as advanced as that of our foreign born fellow subjects.

The very finest workmen, especially those in the possession of some secret processes of doing difficult work, receive wages as high as $6 a day. The average pay of good wood carvers is from $3 to $4 a day. The process of ebonizing cherry wood, for instance is a secret known only to the workman who does it. Even the members of the firm in which he is employed have no right to ask what his secret is. The fact that he can get a finer, more ebony-like surface than any other man gives him a high value at once. Although the use of mechanical devices for carving wood are so much disliked by the best workmen, that sandpaper is forbidden, machinery is now used to cut away the rough parts of a bit of carving. A peculiar tool driven by steam power eats out the wood wherever it goes, and thus a skillful man blocks out in a rough way as much work in a day as 20 men could have done formerly.

The delicacy and lightness of wood carving, and the good pay which fair workmen receive for it, have already attracted many Canadian apprentices, who, untrammelled by union rules, are making rapid headway, and promise to surpass the foreigners.

Oak, cherry, birch, walnut and maple are the favorite woods used for interior finishing, oak and cherry being the most popular. The latter of these is now becoming very scarce, while there appears to be no limit to oak. Red oak, when properly finished, makes very handsome work and is quite popular in some localities. The heart wood of beech, when skillfully treated, has a beautiful appearance, and it is a matter of surprise that it is not more generally employed in hardwood finishings. Perhaps, when birch and maple get scarce, beech will have its innings.

BY THE WAY.

The expeditious manner in which the construction of the King Edward Hotel, Toronto, was pushed through by the contractors, Messrs. Illsley & Horn, has been the subject of much favorable comment. It is a subject for particular regret therefore that the firm have not been rewarded by a substantial profit, such as their energy merited. On the contrary they lost so heavily by the transaction as to be obliged to ask the indulgence of their creditors.

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Some of the persons who incite and engineer strikes of workmen as well as the workmen whom they represent, seem to be seriously afflicted with moral obliqnity. As an example, I would refer the reader to the case of one Samuel Parks, a walking delegate for the bridgemen's union of New York. Parks was arrested charged with accepting from the Hecla Iron Works the sum of $2,000, as blackmail for having agreed to call off a strike at the company's works, yet the bridgemen's union to whose interests Parks appears to have played traitor, is said to have re-elected him by a large vote as the union's walking delegate.

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Difficulty has arisen between the architect of the King Edward Hotel, Toronto, and the New York artist who designed and painted the mural decorations. The courts have been asked to grant an injunction to prevent any person other than the author of the paintings from making changes in them. The architect states that the panels were made too large for the spaces they were to occupy, and that in attempting to fit them in position the artist or the workmen deliberately cut the canvas, and in so doing mutilated the figures in the paintings. In an interview with a reporter the architect is reported to have said that the contractors for this work seemed to think that anything was good enough for Canada. The significance of this remark should not be lost upon Canadian architects who may be tempted to go abroad for skill which could probably be found at home. Some of our Canadian artists have done creditable work in the line of mural decoration, and the question is asked why was not the opportunity given them to submit sketches for these panels? It would have greatly added to the interest of this costly building if, as far as possible, it had been given a distinctively Canadian character, instead of being made a replica of the great hostelries of the United States. One of the charms to the traveller is to be brought into contact with distinctive national characteristics, as exemplified in architecture, social, customs, etc., differing from those to which he has been accustomed.

THE PORTLAND CEMENT INDUSTRY.

Up to the middle of the 18th century it was believed that the hardest hydraulic limes were made from the hardest and purest limestones. In the year 1756 Mr. John Smeaton, an Englishman, in course of certain experiments found that this was not true; that on the contrary hydraulicity was due to the presence of clay matter in the limestone.

A few years later this gentleman was entrusted to rebuild the Eddystone lighthouse. In this structure he used an hydraulic lime made by calcining a rock containing a certain percentage of clay material. So this beacon of the channel "stands to-day not only as a guide to ships that pass in the night, but also as a monument to mark the starting point in all that we know concerning hydraulic cement."

Three-quarters of a century passed and scarcely any advancement was made. Manufacturers and engineers seemed satisfied with the natural hydraulic cements. However, a surprise was in store. In 1824 Mr. James Aspdin, a brick-layer, of Leeds, England, reasoned: "If the degree of hardness and hydraulicity are proportional to the amount of clay matter present, why not add clay to limestone and calcine the mixture?" Experimenting along this line he hit upon a mixture which, burnt at a higher temperature and ground to a powder, formed, when mixed with water, a cement much harder than anything yet produced. Noticing strong resemblance in point of color and texture between his cement and the colitic limestone from the island of Portland, he named the former Portland Cement. He may also have been influenced by business reasons, because this Portland rock had for centuries been in favor as a building stone, being the material used in the construction of many famous public buildings, including St. Paul's Cathedral, London.

Following this a number of works were built in the Medway and Thames district, but, owing partly to the rule of thumb methods used in mixing the raw materials, and partly to crude and imperfect machinery, the products were seldom of the best quality.

The burning was done in a kiln not very unlike the ordinary lime-kiln we see in this country. It consisted of a barrel-shaped shaft about 35 feet high, and 10 feet at its greatest diameter. A few feet from the bottom were placed iron grates, and on these grates alternate layers, composed of coke and bricks of the dried mixtures, were dumped down from an opening near the top. This mass was fired at the bottom and allowed to burn itself out, which required usually three days. After cooling down, the residue consisting of underburnt material and clinker, was drawn off at the base and assorted. This kiln, with improvements tending towards economy, was used entirely until 1884, when Mr. Deitch patented a shaft-kiln which could be worked continuously. Since then other forms of continuous kilns have been built, each giving satisfaction on account of their economy. But the greatest advance came with the advent of the rotary kiln invented by Mr. Ransome, of England, in 1887.

For years England held a monopoly in cement manufacture and exported much. However, this was not to last. In spite of high walls built around the factories, foreigners grasped the secrets of the business.

The Germans, always true to their characteristic national method, which is to develop systematically and patiently the details of a general principle, made no exception of this case. The English had discovered that a superior cement could be made from calcium carbonate and clay; the German determined by chemical means the exact proportions required, and by using the calcimeter could gauge the mixture very closely before burning. They also discovered that a small percentage of plaster of Paris added to freshly ground cement had the effect of making it slow in setting.

Mr. LeChatelier, a Frenchman, in 1887, was the first to give the world a theoretical formula of the chemical composition of cement. He held that it consisted of a tri-calcium silicate together with a slightly variable amount of tri-calcium aluminate.

This stood until 1897, when Messrs S.B. and W.B. Newbury, of the United States, preparing silicates and aluminates of lime synthetically, found that cement was a mixture of tri-calcium silicate and di-calcium aluminate, expressed thus:—

$$X\ (_3CaO.\ SiO_2) + Y\ (_2CaO.\ Al_2O_3).$$

From this we deduce the formula that the percentage of lime = 2.8 × percentage of silica + 1.1 × percentage of alumina. This is the formula used by most cement chemists to-day as a standard for a well balanced clinker.

THE INDUSTRY IN THE UNITED STATES.

Before 1871 no Portland cement was made in America. In that year Mr. D. O. Saylor, of Coplay, Pa., who had been manufacturing a natural hydraulic cement, succeeded in making a low grade Portland cement by burning a mixture of pure limestone and argillaceous limestone which abounds in that locality. Since then Mr. Saylor and his successors have improved and enlarged their factories and to-day these mills along with thirteen others which have since been established within a circle of fifteen miles' radius, are producing a high grade of Portland cement at figures probably lower than anywhere else.

What is known as the dry system is used entirely here. The argillaceous limestone being a little low in lime has a small percentage of pure limestone added to it. The chemical composition of both ingredients is carefully determined, then after being measured in automatic weighing devices and intimately blended by being ground to an impalpable powder, the mixture is burned in rotary kilns.

The success reached by these manufactories in the Lehigh Valley broke the prejudice of engineers against the home-made article, and the demand soon grew greater than this region could supply.

A few factories were then built in New York and other states, but it was in Michigan that the industry was next to establish itself strongly. In this state nearly every lake and marsh rests on a substratum of marl. This is a soft, putty-like material consisting of nearly pure calcium carbonate. In Michigan the color is bluish, but in other places it is as white as snow. It was found that a mixture of this substance with clay could be effected and that the resulting slurry could be easily burned in rotary kilns so as to make a first rate clinker. Several works were at once erected, and although the operators at first saw many dark days in meeting the new conditions, they have ultimately triumphed. And to-day ten large plants turn night and day, during all but the coldest month, successfully producing a high-grade cement.

THE INDUSTRY IN CANADA.

In Canada manufacturers have been awake, and in spite of their being handicapped in respect of the item of fuel, the industry has grown within the last few years to such an extent that now Canadian factories can almost supply the Canadian demand. As yet the manufacture is limited to Ontario. In this province as in Michigan there are many beautiful deposits of marl and clay, so the wet process is used throughout.

Beginning at the west there are several plants located about Owen Sound. Some of these have met with a fair amount of success and have turned out a good quality of cement, but the systems used are more or less cumbersome and as yet no great quantities have been produced. Next year, however, a new plant situated at Durham is expected to reach a considerable output. This factory has nine rotary kilns. All the machinery is electrically driven by power generated from steam.

Farther east, at Lakefield, there was last year erected a plant of three rotaries. The works here are entirely driven by electricity furnished at a power house on the Otonabee River. The mill is small but very efficient and produces a good cement.

About ten years ago the Rathbun Company, of Deseronto, began manufacturing Portland cement at Strathcona. Here there is a large bed of pure blue clay. To this clay they added about 75 per cent. of marl which is brought by the Bay of Quinte Railway from Marlbank. Both these ingredients are very pure, and when properly mixed and ground were found to make a splendid cement. The burning was at first effected in intermittent kilns, but lately in continuous kilns. They now use one Deitch and two Calborgs. This company observed great care and at length produced a brand of cement that is not excelled anywhere. But as Strathcona is 40 miles away from the marl deposits and the system is rather expensive, the works here have ceased to grow. The heart of the industry in the Bay of Quinte district has been transferred to Marlbank, where the Canadian Portland Cement Company has lately built a most modern plant.

Near Marlbank there is a deposit of white marl averaging 97 per cent. calcium carbonate. This extends to about 35 feet in depth. Under it again there is a bed of soft blue clay varying from 10 feet to fifteen feet. It is thus seen that if nature did not intentionally plan the great manufactory now thriving there, she certainly made things very convenient, for there is no waste of raw materials.

The style of kiln now used in all modern plants in America is known as the rotary. It was invented fifteen years ago in England, by Mr. F. Ransome, who experimented in the Medway district with it. In his hands, however, it proved a failure, and in England the idea was abandoned. But a foreigner, this time an American, caught the idea and developed the details in such a way that to-day it is the best style of kiln extant, and during the last three years English engineers have been coming to America to learn the secrets of rotary kiln construction.

This kiln is a steel cylinder from 60 to 100 feet in length and from 5 to 8 feet in diameter. Mounted on roller bearings the kiln is slightly inclined with the horizontal. A large gear surrounding the shell about half way from either end, gives the kiln its motion. It has been found advantageous to have the gearing that drives the kiln connected with a variable speed countershaft by means of which the operator can vary the speed from ½ revolution per minute to two revolutions per minute. This kiln is lined with fire bricks to within 20 feet of the slurry end. This part is fitted with channel irons placed two feet apart and running parallel with the longer axis of the cylinder. At the elevated end a smoke-stack is built to carry off the waste gases.

At the lower and opposite end a 7 inch iron pipe enters through the centre of the hood. This pipe furnishes the kiln with fuel which at the present time consists of bituminous coal, dried and ground to a powder. The coal is prepared in a separate department. First it is conveyed from cars to rotary dryers, then crushed in crushers and ground in tubemills in which flint pebbles take the place of steel balls. From the tubemill it is conveyed to tanks with hopper bottoms, placed in front of the kiln. A screw conveyor driven by a speed regulator draws it from this tank dropping it into a syphon where an air blast drives it into the kiln. It burns immediately on entering the kiln, giving a temperature of about 3000° F. in the hottest zone which extends from 5 ft. to 25 ft. back.

The slurry which is pumped into the kiln at the elevated end slowly winds its way to the lower end. As the kiln revolves the slurry is carried up at first by the channel irons, and when a certain height is reached, it falls to the bottom passing through the hot gases which at first carry off the water vapor and later the carbon dioxide. After passing beyond the reach of the channel irons, it is dry enough to stick to the bricks till it reaches the top, and this operation is repeated once for each lineal foot the material travels. By the time it reaches the hottest zone it is thoroughly dried, but not completely calcined. In this zone the calcining is finished and a chemical combination takes place between the basic and acid elements of the semi-fused materials forming clinker. The clinker then rolls out of the hood in particles varying in size from a pin-head to a hickory nut. The advantages of this system of burning may be summed up as follows: (1) The slurry does not require to be dried and moulded into bricks before entering the kiln. This saves much labor, time and expense. (2) The burner has complete control of the process of burning. He has three variables at his command; he can vary the feed of the slurry, and coal, and also the speed of the kiln. By means of blue glasses he can see into his kiln from either end and watch the whole operation. (3) No raw material gets past the hot zone because the burner can distinguish the raw from the burnt, and when he sees raw material from the front end he adds heat or slows his kiln.

An objection is raised by a few to this system of burning. They hold that where so much coal is used to make the clinker, a great deal of ash from the coal must enter into the clinker. These persons lose sight of the fact that the greater part of the ash is silica and alumina, which acts as clay, and is in no wise objectionable, because it can be counteracted in the raw mixture.

However, we must admit that although the rotary kiln is the best kind known, it is still a very wasteful machine. In most mills the gases pass out of the smokestack at 1500° F., and the clinker passes out of the other end at a still higher temperature. Hence, at a glance one sees the tremendous loss of energy involved. Here lies the reason why too much coal is used. This fact is claiming much attention now and we may expect radical improvements soon.

ARTIFICALLY COOLING THE CLINKER.

The scheme, which is by no means satisfactory, but is looked upon as one of the best extant, is Mr. Mosier's system. This is installed at Marlbank. The Mosier cooler is a cyclinder 20 feet high and 8 feet in diameter. One is sufficient to cool the clinker from two kilns. It stands in front of the kilns, and as the clinker drops out of the kiln hood an elevator lifts it to the top of the cooler. It falls inside and strikes cones or discs which surround a cast-iron pipe running up through the centre. Cold air is forced out through openings in this pipe, and as the clinker falls from disc to disc it is cooled. At the bottom the cold clinker is drawn off into a dump-car, which is hoisted to large bins above the grinding machinery in the grinding department.

GRINDING THE CLINKER TO CEMENT.

Before the car of clinker is dumped into the bin above the ball mills, about 1½ per cent. of Plaster of Paris is added. If it were not the cement would, as before mentioned, be too quick in setting. The clinker is then fed into each ball-mill by an automatic disc feeder.

The finishing grind is done in No. 16 tubemills, lined with blocks of flint instead of blocks of wood. Flint pebbles are used here.

Every few hours samples of each mill's grind are sifted, and if there is more than 5 per cent. residue left on a sieve of 10,000 meshes per square inch, or more than 20 per cent. on a sieve of 40,000 meshes per square inch, the feed of the mill is reduced.

At the end of every twelve hours an average sample of the grind of that period is made into briquettes, having a section of one square inch. These are made by mixing cement with about 21 per cent. of water in the case of neat briquettes, and a less percentage where a mixture with sand is used. Two of these are broken at the end of 24 hours, during which time the briquettes have lain in moulds in a moist atmosphere. The remaining ones are then placed in water. Two more are broken in each of the following periods, three days, seven days, twenty-eight days, and three months, to determine their tensile strength, which must surpass standard specifications. A sample of cement made at Marlbank this summer taken at random, ran as follows:

1	day,	275	lbs. per square inch.
7	days,	630	" " "
28	days,	925	" " "
3	mos.,	960	" " "

From this same sample pats are made, which being set in moist air give the time of both initial and final set, and after being placed in steam for twelve hours, and then in water for the same length of time, prove by their condition at the end of the test whether or not the cement is sound.

All the leading Canadian manufactories go through this elaborate system of tests. Engineers need no longer entertain fears and doubts as to the quality of their work. Canada produces as good Portland cement as is furnished by any country in the world.—Percy F. Balfour, in Queen's Quarterly.

THE DOME.

Prof. Baldwin Brown recently read a paper before the Edinburgh Architectural Association in which he sought to vindicate the title of the dome to a place among the architectural forms suited to a Christian church. He pointed out that the main characteristic of the dome in general was its embracing, uniting quality, and said it was important so to employ it as to obtain from its full value as a unifying element in a composition. The employment of the dome as a mere roof, as in the multiplied domes of later byzantine churches, such as St. Mark's at Venice, or the series of cupolas along a rectangular aisle, as in churches of the West of France, was not the way to secure all the advantages of that most beautiful and expressive feature. The dome, wherever it appeared, lent distinction to a building, and it had been rightly pronounced to be on the whole the most satisfying to the æsthetic sense of all architectural forms. The real power of the dome was, however, only exhibited when it was made to exercise an influence far beyond the limits subtended by its own circumference, and brought into harmony the complex elements of a subdivided plan. The pantheon of Hadrian at Rome, the starting point of the development of dome construction in the modern world, completely embraced the spaces of the plan it surmounted, but this plan was that of a regular unbroken circle. The Christian builders desired to use the dome for their own purposes; but such a plan as that of the Pantheon was not suited for a Christian meeting-house. One of the most interesting chapters in the whole history of architecture was occupied with various experiments made by early Christian architects to adapt the dome to plans suited to the requirements of congregational worship. Their efforts to overcome the difficulties which presented themselves were sufficient proof that they recognized the dome as a form not only beautiful in itself, but expressive of Christian ideas, and this was a consideration too often lost sight of by the Mediævalists of to-day, who, as the discussions connected with the new Liverpool Cathedral had shown, were still dominated by the ideas embodied in the Gothic revival of the first half of the 19th century.

ARCHITECTS' FEES IN RELATION TO FIRE INSURANCE.

It would seem to require no argument to show that when appraising the owner's loss on a burned or partially burned building the insurance companies should include architects' fees, which item entered into the original cost of the building upon which the insurance is based In Canada this item is included in the owner's claim and is allowed by the insurance companies, but in England there appears to be no recognized practice with regard to this matter.

Enquiry has recently been made by Mr. T. Myddleton Shalcross about the practice of eighteen or twenty of the principal British fire insurance companies in respect to the payment of architect's fees. He has ascertained that some of the companies refuse to pay architect's fees incurred in the reinstatement of fire damage, notwithstanding that premium has been paid upon architect's fees, originally incurred, as part of the cost of the building insured; that other fire insurance companies only pay fees in cases where they have been

separately mentioned and described in the policy; and, again, that other fire insurance companies always pay such fees whether or not they are separately described in the policy. Those who think they are insured against fire would do well, therefore, says Mr. Myddleton Shalcross, to inquire from their assurers how the matter stands in their own particular cases, as otherwise, should a fire occur, they may find themselves uncovered to the amount of several hundreds of pounds in respect of their premises. For example, in the case of a building costing, say, £10,500, including architect's fees, and totally destroyed, the owner might find himself only able to recover £10,000, and have to bear the loss himself of the remaining £500, or, in the alternative, have to be satisfied with an inferior class of work in the reinstatement of the premises, i.e., work performed at the will of a builder without the direction and control of an architect, and there would, of course, be a similar result in case of a partial destruction of the premises pro rata.

ABSORBENCY OF CLAYS AS AFFECTED BY DRYING.

Mr. H. J. Cambie, in a paper recently read before the Canadian Society of Civil Engineers, gives the results of a curious and important observation upon clays. It appears that a portion of the Canadian Pacific Railway passes through a valley almost without rainfall, through the bottom of which flows the Thompson River. Above the river are high clay bluffs, forming the edge of a sort of table-land, some 200 ft. above the river. When irrigated, this clayey table-land is fertile, producing several crops of hay a year, and the farmers utilize it for that purpose, irrigating it with water from the river or its tributaries. Since irrigation of the land began, some forty years ago, there have been many land-slides. One of these, a few years ago, carried a tract of about a hundred acres directly across the river, forming a dam 75 ft. high, and completefy blocking its course; and another recently damaged the railway. In consequence of the latter, suit was brought by the railway company to prevent the farmers from irrigating their fields, on the ground that the irrigation softened the clay subsoil, allowing the ground to slip. This view was confirmed by experiment, the experts, of whom Mr. Cambie was one, finding that while ordinary clay, in the moist condition in which it is usually found in the ground, will not absorb any more water, and is only superficially affected by washing, clay that has once been so completely dried as to lose its cohesive property absorbs water like a sponge until some 60 per cent. of its weight has been added, when it falls into a liquid mud, nearly as fluid as water. Even when the clay has not become powdery by drying, but has taken the form of indurated lumps, it will soak up the water until converted into fluid mud. As the clay of these hayfields exists, to a great extent, in the form of such dry lumps, it seems probable that copious irrigation through the season might liquefy it, so as to allow the ground to slide; while the objection that the clay on the immediate bank of the river was not affected appeared to be answered by the fact that this clay, being constantly kept moist by the water of the river, preserved its solidity.

A COLOSSAL STRUCTURE.

Mr. McKim, the well-known architect, is said to have designed a Stadium of larger area than the Colosseum at Rome, to be erected on the athletic field at Harvard College. This structure will resemble a continuous stand following the two long sides of a football field and one of the short sides. The length of the arena enclosed will be no less than 450 ft., and the extreme length of the whole building as viewed from the road that crosses Harvard Bridge will not fall far short of 200 yds. In other words, the stadium will be about equal to the Colosseum in length, but will afford a larger arena. The plans of the Harvard stadium show a design as remarkable for simple elegance as for constructive ingenuity and economy. The frame work will be of iron girders, the facing of concrete blocks. The vast iron skeleton within will be entirely concealed under a mask of yellow white that will present, with practically the same effect as solid stone, all the familiar aspects of a Roman amphitheatre. Tier upon tier of seats will rise to a height of 100 ft., affording seats for 24,000 spectators on ordinary occasions, for 40,000 in an emergency. Behind and above the topmost row will run a roofed gallery supported on light pillars; this is designed to provide a sheltered promenade and to give a necessary architectural finish to the building as seen from within.

The exterior aspect of the stadium will be on lines that the form of the interior makes inevitable. A colonnade of three super-posed galleries surmounted by a heavy cornice, unadorned by superfluous embellishment, will give simplicity and severity to the outward aspect of the building. The height being about two-thirds that of the Colosseum, the massiveness of the piers, or rather of the appearance of the piers, will also be somewhat less.

NOTES.

The Royal Institute of British Architects have this year awarded the King's gold medal to Mr. Charles F. McKim, a distinguished architect of the United States.

Mr. R. F. Gagen, of Toronto, and Mr. Wm. Hoper, of Montreal, have been appointed Commissioners to get together as representative collection as possible of paintings by leading Canadian artists, living and deceased, for the approaching Dominion Exhibition in Toronto.

An Act has just passed the Prussian Parliament which empowers local authorities to forbid any form of conspicuous announcement that impairs the landscape or any placarding of private premises whether relating to the premises conducted therein or not. The Legislature of the state of Massachusetts has passed a similar Act. So far as known no legislation on this subject has yet been enacted in Canada, but it is to be hoped that on this important subject public opinion here will not lag behind that of Great Britain, Germany and the United States, all of which countries have recognized and sought to abate the evil. Unfortunately the mischief which such legislation aims to prevent has already to a large extent been done, as witness the glaring announcements on barns, etc., on the principal lines of travel all over this continent. Particularly is the evil manifest on the outskirts of towns and cities.

According to the Engineering Record over-exposed blueprints can, in many cases, be restored by immersing them in a bath of weak ammonia, using about two spoonfuls of ammonia to a tumblerful of water. This will cause the print to turn first purple then pink and after a time nearly white. When it has reached the pink stage, rinse the print and immerse in a bath composed of water, 1 tumblerful, muriatic acid, 1 teaspoontul. The blue color will then return much brighter than before, but this time the lines will be white and clear. Wash thoroughly before drying. Stains on tracings caused by blueprint water can, also, be removed, according to the American Machinist, by painting the spot with a camelshair brush dipped in a 10 per cent. solution of oxalate of potash. This same solution may be used for making white lines on blueprints. Almost any alkali will bleach a blueprint, but this solution will turn the blue to a pure white.

PROPOSED STANDARDS OF FIRE RESISTANCE.

The executive of the British Fire Prevention Committee, having given their careful consideration to the common misuse of the term "firepoorf," consider the term "fire-resisting" more appicable for general use, and that it more correctly describes the varying qualities of different materials and systems of construction intended to resist the effect of fire for shorter or longer periods, at high or low temperatures as the case may be, and they advocate the general adoption of this term in place of "fireproof."

Further, the executive, fully realizing the great variations in the fire-resisting qualities of materials and systems of construction, consider that the public, the professions concerned, and likewise the authorities controlling building operations, should clearly discriminate between the amount of protection obtainable or in fact requisite for different classes of property. For instance, the city warehouse filled with highly inflammable goods of great weight requires very different protection from the tenement house of the suburbs.

The executive are desirous of discriminating between fire-resisting materials and systems of construction affording temporary protection, partial protection, and full protection against fire, and to classify all building materials andsystems of construction underthese three headings. The exact and definite limit of these three classes is based on the experience obtained from numerous investigations and tests, combined with the experience obtained from actual fires, and after due consideration of the limitations of building practice and the question of cost.

The executive's suggested minimum requirements of fire-resistance for building materials or systems of construction will be seen from the standard tables appended for—I. Fire-resisting floors and ceilings. II. Fire-resisting partitions. III. Fire-resisting doors, but they could be popularly summarized as follows: (a) That temporary protection implies resistance against fire for at least three quarters of an hour. (b) That partial protection implies resistance against a fierce fire for at least one hour and a half. (c) That full protection implies resistance against a fierce fire for at least two hours and a half.

The conditions under this resistance should be obtainable, the actual minimum temperatures, thickness, questions of load, and the application of water can be appreciated from the annexed tables by all technically interested, but for the popular discrimination which the executive are desirous of encouraging—the time standard alone should suffice.

It is desirable that these standards become the universal standards in this country, on the Continent and in the United States, so that the same standardisation may in future be common to all countries, and the preliminary arrangements for this standardisation are already in hand.

STANDARD TABLE EOR FIRE-RESISTING FLOORS AND CEILINGS.

Classification.	Sub-Class.	Duration of Test at Least.	Minimum Temperature.	Load per Superficial Foot Distributed.	Minimum Superficial Area under Test.	Minimum Time for Application of Water under Pressure.
Temporary protective class	A	45 mins.	1500° F.	Optional	100 sq. ft.	2 mins.
	B	60 mins.	1500° F.	Optional	200 sq. ft.	2 mins.
Partial protective class....	A	90 mins.	1800° F.	1 cwt.	100 sq. ft.	2 mins.
	B	120 mins.	1800° F.	1½ cwt.	200 sq. ft.	2 mins.
Full protective class.....	A	150 mins.	1800° F.	2 cwt.	100 sq. ft.	2 mins.
	B	240 mins.	1800° F.	2½ cwt.	200 sq. ft.	5 mins.

STANDARD TABLES FOR FIRE-RESISTING PARTITIONS AND SINGLE DOORS, WITH OR WITHOUT FRAMES.

Classification.	Sub-Class.	Duration of Test at Least.	Minimum Temperature.	Thickness of Material.	Minimum Superficial Area under Test. For Partitions.	Minimum Superficial Area under Test. For Doors.	Minimum Time for Application of Water under Pressure.
Temporary protective class.	A	45 mins.	1500° F.	2 in. and under	80 sq. ft.	20 sq. ft.	2 mins.
	B	60 mins.	1500° F.	Optional.	80 sq. ft.	20 sq. ft.	2 mins.
Partial protective class.	A	90 mins.	1800° F.	2½ in. & under	80 sq. ft.	20 sq. ft.	2 mins.
	B	120 mins.	1800° F.	Optional.	80 sq. ft.	20 sq. ft.	2 mins.
Full protective class	A	150 mins.	1800° F.	2½ in. & under	80 sq. ft.	25 sq. ft.	2 mins.
	B	240 mins.	1800° F.	Optional.	80 sq. ft.	25 sq. ft.	5 mins.

FAILURE IN A BUILDING CARRIED ON COLUMNS.

Some interesting and instructive data are given in the appendix to a recent report by Sir Wm. Garstin of the Public Works Department of Egypt regarding the failure of a four storey prison building in Cairo, and the method employed to repair the same. The ground, first, and second floors provide accommodation for 250, and the third floor for 200 persons. The corridor-wall of the top floor is carried by two cast-iron columns, one above the other, having a total height of 35 feet 6 inches, and transmitting a load of 58 tons to the stone base of the columns. The building is founded on a float of pozzuolana concrete, 4 feet in thickness, laid at permanant infiltration level. This form of foundation was adopted because the excavation showed that the whole area covered by the foundations had at one time been a deep depression which, many years previously, had been filled up with earth, stones, and rubbish.

The infiltration water prevented the excavation being carried any deeper to get to the virgin soil. As there are no cracks in the outer walls of the building, it may be assumed that this float of concrete is intact.

Soon after the completion of the building, cracks appeared in the brick cross-walls of the top storey. Starting at floor-level, where this wall rests on the corridor-wall below, the cracks followed a straight line drawn from this point to a point where the ceiling meets the corridor-wall of the top storey, which is carried on the columns.

These cracks were evidently caused by the columns settling, and on investigation it was found that the base-flanges of some of the columns were cracked. On stripping the asphalt off the stone bases these also were found to be cracked, and the failure was therefore attributed to the crushing of the stone. It appeared also that the base-stone had been dressed hollow, which would have the effect of throwing the pressure on the outside of the base-flange, and would account for its being cracked. It was further observed that the stones were saturated with damp, which made them soft. This was the result of the water used in swabbing down the ground floor finding its way to the stone, through the joint between the asphalt and the cast-iron column. By calculation it was found that the base-stone, which was of limestone and measured 2 feet 8 inches square by 1 foot 6 inches in depth, was overloaded, as it was exposed to a pressure of 590 lbs. per square inch, whereas ordinary samples of this stone are crushed at a pressure of 3,000 lbs. per square inch, giving a factor of safety of only 5. This explanation of the failure was not very convincing. That the stone should have crushed when only loaded to one-fifth of its laboratory crushing-strength, even although it was weakened by being saturated with damp, seemed doubtful. New stones 3 feet 6 inches square by one foot 6 inches in depth were ordered from Trieste, and new columns from England. Tripod shores on wide timber bases were erected round the columns, and gypsum tell-tales showed that the movement continued. Much deliberation was given to deciding on the best means of supportiug the superstructure (a load of 58 tons) while the thirteen columns and base-stones were changed. No risks could be run which would endanger the lives of between 400 and 500 people who inhabited the building. The result of this forethought was so satisfactory that during the work no change was found necessary either in shoring or in the method of working.

The shoring consisted of a pair of A-frames set up under the girder carrying the gallery at first-floor level. Their feet were let into timber bed-plates, 2 feet 4 inches by 1 foot 2 inches, with a tightening-wedge under each foot. These wedges were especially useful in loosening the shoring before removing it. Under the bed-plate and directly below each foot were inserted iron folding-wedges working between iron plates. The lower plates rested on a bed of cement concrete 12 feet by 12 feet by 3 feet 6 inches in thickness. This bed of concrete was necessary to distribute the pressure, all of which came on new filling, 10 feet in depth between the concrete foundation and the bottom of this concrete. The pressure on the earth was thus reduced to less than ½ ton per square foot.

The longtitudinal rolled joist (1 foot 2 inches in depth) at the first-floor level not being stiff enough to carry the weight between the A-frames when the column was removed, Iron joists which bore on the A-frames were packed in under the flanges of the saddle-piece between the upper and the lower column. Also vertical shoring with tightening-wedges was carried up to main girder carrying the top-story corridor-wall. The upper columns were thus relieved of their weight during the operation. All the shoring was braced across the building and tied to the main walls. To avoid vibration as much as possible in tightening up the wedges when transferring the load to the shores, two 50-ton hydraulic jacks were set up between the A-frames and the base-stones. These took the first lift. A piano wire was stretched between the main walls, touching the columns, to enable the vertical movements to be recorded.

On excavating to put in the cement-concrete for the first column, the cracks in the base-stone, which were little more than visible on the surface, were found to be wide enough at the bottom of the stone to allow of the insertion of the fingers of the hand up to the palm. Wrought-iron straps were quickly fixed round the stones to prevent them opening further, and shoring was erected under the longitudinal girder of the first floor at the edge of the pit. A boxing of 1½-inch boards was made round the pit, to prevent the earth-filling from falling in while the concrete was being rammed. The concrete was allowed to set for 7 days before the shores for changing the columns were erected. When all was in place the wedges on the first and second floors were driven hard with a sledge-hammer. The jacks were then worked until a slight rise (1/32 to ⅛ inch) was observed on the wire. The iron folding-wedges under the A-frames were then driven hard. Stone-cutters with chisels then cut away 1 inch clearance under the column, which was thus left suspended by the bolts of its upper flange. The jacks were next slacked, when a drop of 3/32 inch to 3/16 inch* occurred. After a short pause to let the shores settle down to the weight, the rest of the base-stone was cleared.

The main cause of the failure was then discovered. The stone had been levelled by means of wooden wedges, which were left in place, and had been grouted with pozzuolana mortar. The grouting in some cases had not even touched the underside of the stone at the centre, and in all cases the bed was found to be hollow, so that the whole weight was supported on the wedges and an outer margin of about 6 inches in width where the mortar could be rammed under with a trowel. Consequently the stone had broken into four pieces. There was not much evidence of what might strictly be called crushing, and the dip of the stone in breaking and settling into the hollow gave the appearance which was attributed to faulty dressing, and accounted likewise for the flanges of the column becoming cracked.

The old base-stone having been cleared, the old column was removed, and, in order to provide clearance for getting in the new stone and column, the top course of the rubble masonry under the stone (about 6 inches in depth) was demolished. The new Trieste stone base was then slung into place, by means of a lewis and differential blocks, without being set, and was left about 6 inches below its ultimate level. The new column was then slung and bolted up permanently into its place. A wrought-iron plate, 1 inch thick and planed on its upper face, was laid between the stone and the base of the column. The stone base was next raised on wooden wedges so as to leave only ⅜ inch to ½ inch clear below the column. After the stone had been levelled, a grouting basin in brick masonry in cement was built round it, at a little distance from it, the walls being 8 inches higher than the bottom of the stone. Neat cement grout was introduced under the centre of the stone by means of a 2-inch pipe. The grout was under a head of 4 feet or 5 feet. In this manner the space under the centre of the stone ought to be as well filled as any part. By having a head on the grout a flow was established from the centre to the outside of the stone, which carried with it the air and cement scum. The basin was filled up by this means, thus throwing 8 inches head on the grout, which allowed the water in excess to rise to the surface. The horizontal portion of the pipe was not withdrawn.

Thin steel wedges were used to force the wrought-iron plate against the base-flange of the column, and the ⅜-inch space under the plate was grouted with neat cement under about 4 inches head. After setting for 7 days, the wedges under the stone, as well as the steel wedges, were withdrawn, and the shoring was removed. The drop on removing the shoring varied between nothing and 3/32 inch. The greatest collective drop on any column, adding all the movements together, was less than ¼ inch, the mean drop of the thirteen columns being 5/32 inch and the least drop 3/32 inch.

*These figures represent the maximum and minimum observations taken on the thirteen columns.

NOTES.

In setting cut stone work in England lime mortar only is used. Cement is never used for that purpose, as it stains the stone.

Flatted work will sometimes require a coat of size before gilded work is put upon it, as at times there is a little suction. This would draw the size and cause imperfect gilding.

The City Engineer of Winnipeg has submitted an estimate to the city council for the construction of a railway connecting Winnipeg with the city quarries, at a cost of $138,425.

The report of the building inspector shows that in proportion to size, Westmount's activity in the building line has been more marked than that of Montreal.

The assets of the Holywood Paint Company, of Hamilton, have been purchased by the McLennan Paint Company, Limited, of Buffalo, who will continue the business.

Instead of the iron fireproof curtains generally used in French theatres, one made of sheet aluminium has been adopted for the opera house at Besancon. It is one-fifth the weight of an iron curtain of equal dimensions.

Dr. J. M. Woodbury, commissioner of street cleaning in New York, proposes to manufacture paper bricks from the dry city rubbish, of which 90 per cent. is waste paper. These bricks are intended for fuel and Mr. Woodbury estimates that private consumers could purchase them for 4 cents a cubic yard.

A meeting of the Executive Committee of the National Master Painters' Association of the United States and Canada, was held in Toronto in the early part of last month, to consider arrangements and outline the programme for the annual convention, which will meet in Toronto next February. A very interesting meeting with a large attendance is looked for.

A machine for splitting laths for plaster work has been introduced in Great Britain. It is said to turn out in a day as many laths as would in the ordinary course be produced by 20 skilled men. The advantage of split as against sawn laths is said to be that they are tougher (following the grain) and have a rougher surface, so that plaster adheres more firmly.

The launching of new cement manufacturing companies in Canada goes merrily on. Hardly a month passes without witnessing the granting of charters to new companies in this line. In every case, if we may believe the statements of the promoters, there is going to be millions in it for the stockholders, but our opinion is that if the manufacturing capacity continues to increase at anything like the ratio witnessed during the last two years, there will soon cease to be a fair profit in the business for anybody. Admitting that the demand for cement has increased at a truly wonderful rate, it is nevertheless being outstripped by the growth in manufacturing capacity.

The master and journeymen carpenters of Halifax agreed to submit their differences as to scale of wages, to a board of arbitrators composed of the County Judge, the President of Dalhousie College and a representative of the Trades and Labor Council. The arbitrators have concluded that 25 cents an hour be paid to first-class workmen only, the men to be entitled to the new scale of wages from the first of June. The decision as to who are first-class workmen is to rest with the foremen of the several firms who, it is agreed, shall not be members of any union. The day shall be nine hours, and all who cannot rate as first-class men are to receive the old rate of 12 cents per hour. The dicision has been accepted by all parties concerned.

Nothing probably has exasperated the average architect more often or more thoroughly than the average mill company's book of stock designs of doors, mouldings, balusters, railing, newels, etc. Just why it is necessary to turn out such abominations, when it would not cost them a cent more to produce something along correct lines, artistically speaking, is one of the unsolved problems of the day. Did they but realize that these things all have their legitimate effect upon the public taste, especially those who seldom rub up against architects, possibly they would revise their books and get out something equally pleasing to the critical taste of the architect and the untutored ideas of their customers, who must certainly be easily pleased, judging by the stuff they continue to buy and use.

In answer to a correspondent the Painters' Magazine says it depends to a great extent on the composition of the plaster as to whether a new or "hot" wall can safely be painted. We have seen walls that were painted in less than two weeks after being finished, and yet with only two coats of lead, zinc and oil paint they did not spot or streak in the least. A wall that we do not know anything about is always safest to paint after a year or so, but as people will not wait, it is best to take the precaution of giving a coat of strong vinegar direct to the plaster. Let this stand two days, then prime with pure lead and raw linseed oil, adding a trifle of japan. Over this, when dry and hard, give a coat of glue size, which will save at least one, probably two coats of paint and will prevent spotting or discoloration.

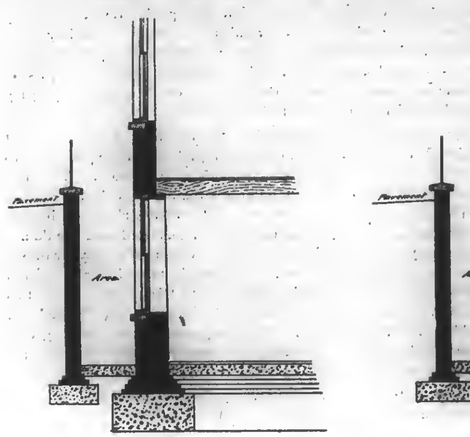
The Iron Age is authority for the statement that, with the same number of hours per day and the same rate of wages, the erection of steel framework in New York costs from two and a half to three times as much as in other cities which are also supposed to be cities of high building costs. It is stated that a hand riveter who could easily average 250 to 300 rivets a day contents himself in that city with 80. In other cities, on straight work, a good man finishes up 80 an hour. The pneumatic riveter, which has proved such an annihilator of time in other cities, finds something different in the air of New York, and strikes a slow gait. The same tool in the hands of a man elsewhere will drive 1,500 to 2,000 rivets in a day, and only 250 to 300 in New York. The claim is, in fact, made that structural erection in New York costs $15 to $18 per ton, against $6.50 to $8 per ton in other large cities. This is a "condition and not a theory," and must be faced alike by employers and by the men themselves.

Tensile tests of wrought iron bars, showing the effect of overstraining followed by intervals of rest, were made at the Watertown Arsenal upon four kinds of wrought iron: Common Refined, Best Puddled, Burden's Best and Norway. One test on each kind was made in the ordinary manner. With the other specimens an overstraining load was applied, ranging from 25,000 to 45,000 pounds per square inch, followed by an interval of no load, after which the loading was resumed until rupture was reached. The gain in the elastic limit produced by the overstraining loads was well shown throughout the series, and ranged from 2,000 to 6,000 pounds per square inch. It was also apparently shown, although these effects are not so well marked, that the greater the magnitude of the overstraining load and the longer the interval of rest between the two loadings, the greater was the gain in the elastic limit. No effect of the overstraining load upon the contraction of area was apparent.—Engineering Record.

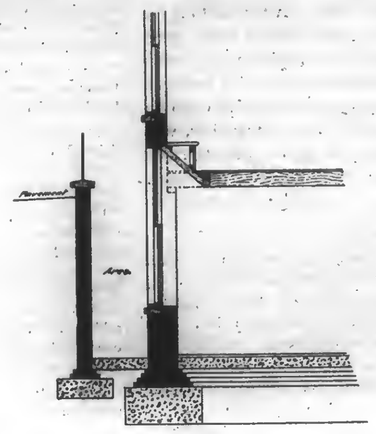
NATURAL LIGHT TO BASEMENTS.

An inexpensive means of providing additional light to a basement room is given in the sketches accompanying this article by B. Wand, reprinted from the Builders' Journal. Fig. 1 shows a basement room abutting upon an area and looking out upon a dead wall. The ceiling-line of this room is practcially level with the pavement, and in the figure the window is kept to its full height—at a height which would, as a matter of fact, necessitate the threading of a short length or rolled steel joist, or some other contrivance, through those ends of the floor joists which run above the window openings.

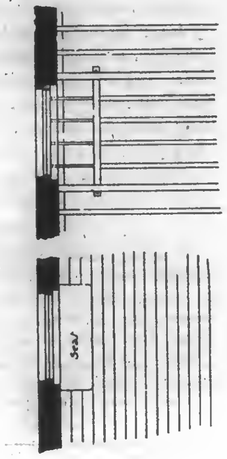
In Fig. 2 is shown precisely the same room, area and wall, but with the window carried well above pavement-level, and giving the room a very considerable increase of natural light. The floor-joists are trimmed at the window openings just as they would be for a fireplace, the trimmed space being filled in with pieces of 3in. by 2in. or other light stuff to carry the lathing and plaster or matchlining with which the soffit is to be covered. Fig. 3 shows (a) the trimmed space with filling-peices



—Fig. 1.—



—Fig. 2.—



—Fig. 3.—

— Scale of Feet —

and (b) the floor when laid. The objection to this mode of dealing with a floor has been that small bulkheads are formed over those portions of the floor beneath which come the basement windows; and this is met in my plan by the provision of window seats, which in their turn entirely cover the bulkheads. It may still be objected that these window seats would in themselves be unsightly; but when I say that I have seen them just as described in one of the finest block of flats in London—Albert Court, Knightsbridge —I think that that contention also is met. As a matter of fact, neatly panelled, and finished to match the other work in the room, they form quaintly attractive features, which the tenants contrive to render still more attractive by rugs, cushions and general "drapery."

In the plan I have shown the trimming is applied to a floor with wooden joists running from front to back of the building; but with joists thrown across, or with concrete or any other kind of floor, the idea is just as easy of adoption. In the case of shop property the bulkheads might not be objected to, or, if they were, countering or show-casing might take the place of the window seats. Where an area is covered with pavement lights the same idea is practicable so long as the lights are on private ground and no objection is made by the local authority to their being raised to a level with the added height of the windows. They could then be thrown back at an angle from window head to pavement level, or built square out from the head with a return to pavement level, the prisms being arranged to throw the light right back into the room; and, either way, a considerable increase of light would be obtained.

SANITARY CHARACTERISTICS OF MADE GROUND.

Architects and house owners should be interested in learning the results of an investigation recently conducted by Dr. W. G. Savage and Mr. J. H. Sugden, bacteriologists for the Corporation of Cardiff, Wales, to determine to what extent made ground should be regarded as a menace to the health of the occupants of houses built thereon, and how far local authorities are justified in passing by-laws prohibiting the use of such ground as building sites. The following deductions are made based on a long and careful examination :—

"The refuse as deposited contains a very large number of organisms, many of which are in the main different from those met with in ordinary soil. These made-soil organisms, as they may be called for convenience of reference, rapidly diminish in number under the conditions under which they are placed. This diminution goes on for the first two or three years. After two or three years, however, the ordinary soil organisms begin to invade this material, and apparently thrive abundantly in the rich organic material available to them. This causes a marked increase in the total number of organisms present in the soil, and the total number remains large, until in quite old soils a diminution is again met with. These soils begin to lose their special bacterial content after two or three years, and from that time begin to take on the characters of ordinary soil."

NOTES.

One of the features of the modern house that makes or unmakes its finished elegance is the plumbing and all care and attention given to that branch of the house will prove profitable. So rapid have been the strides toward betterment in plumbing fixtures during the last few years that not everyone is familiar with the high grade sanitary appliances which are sold to-day. The James Morrison Brass Manufacturing Company, Limited, of Toronto, have for years been the designers of many of the improved appliances used by plumbers and their line of equipment for every purpose to-day represents the highest attainment in manufacture. Anyone who is interested in modern plumbing would find the catalogue of the Morrison Company of interest and value.

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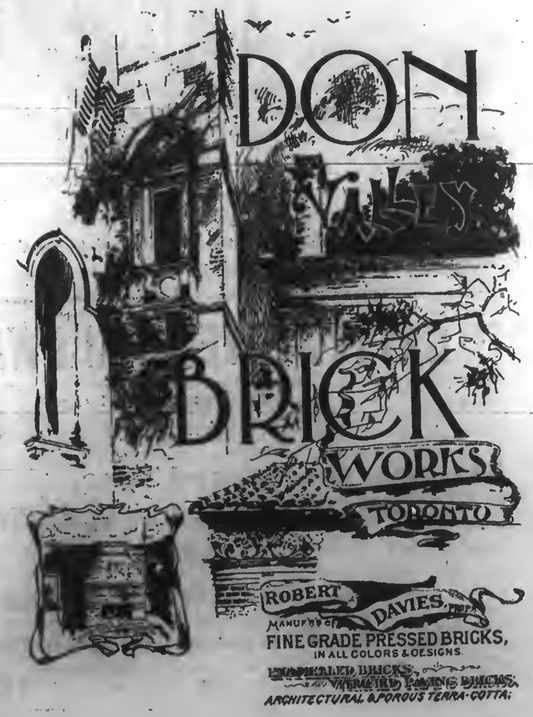
NOTES.

The demand for hand-molded brick is increasing in the East. The machine-made brick now sells at from $6 to $7 per thousand while the hand-molded brick readily bring $10 a thousand. Many brick yards are adding to their hand-molding facilities. It is contended that machine-made brick chip easily at the corners and disintegrate more readily under the action of fire when used for furnaces and boiler linings than the hand-molded product.—Brick.



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The Canadian Architect and Builder

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Golf Club House, near Montreal, Que.—A. F. Dunlop, Architect.
Summer House at St. James, near Winnipeg.
Houses, Nos. 348 and 350 Elgin Avenue, Toronto.—Chadwick & Beckett, Architect.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Entrance, No. 3 Berkeley Square, London, Eng.
Bishop's Chair, Trinity College, Toronto.—Eden Smith, Architect.

ILLUSTRATIONS IN TEXT.

Views of the Guild of Handicraft, London.

CONTENTS

Editorial 143-144
Notes of Travel.—IV, (The Guild of Handicraft) . 145-146
Bridge for the Canadian Niagara Power Company . 147
Details of Modern Hospital Design 148
Fire Retarding Windows 149
A Novel Suggestion 150
Ancient Lights 150
The Scientific Basis and Commercial Feasibility of Heat Radiators, using Air Instead of Water or Steam 151-152-153
Northwest Letter 154
A Departure in Hot Air Heating 155
Wiring Methods and Materials 155
By the Way 156

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Grand Stands.

The return of the football season should act as a reminder to architects and builders as well as municipal authorities, that the lives of many hundreds of spectators will depend on the knowledge of those who design grand stands and the honesty of those who build them. Following the disaster on the football field at Glasgow last year, comes news of the recent collapse of one of these grand stands at Perth, Scotland, resulting in serious injury to thirty persons.

Plainness in Design.

Less than two years ago we took occasion in these columns to deplore the cheap and meaningless ornament with which most of the furniture manufactured in the United States and Canada was being overloaded, and the consequent perversion of the public taste. It is gratifying to observe that in the short period that has since elapsed, there has taken place a radical change in furniture design, with the result that plainness is now the leading characteristic. The change is a most agreeable and wholesome one, and will be certain to have a beneficial effect on architectural design and furnishings. It would be interesting to learn what have been the principal causes which have brought about within so short a time so complete a revolution in popular taste.

The Commercial Congress.

The important bearing of commercial interests on national affairs and policy was well illustrated by the keen interest manifested throughout the Empire in the deliberations of the Commercial Congress held last month in Montreal. There is evinced a strong desire on the part of the various colonies and some of the leading British statesmen that the various parts of the Empire should be more firmly welded together. It is realized that one of the best means to this end is by promoting closer trade relations. A step in this direction was taken by the Commercial Congress in adopting a resolution affirming the desirability of this object and recommending the Imperial government to appoint a special commission to make thorough enquiry into the matter and make such recommendations as in its judgment might seem wise and feasible. The subject is of the highest possible importance to each constituent part of the Empire as well as to the nation as a whole. The

British government should lose no time in appointing a Commission capable and willing to give it prompt and careful consideration. The national life of the people of Canada, in all its varied relations and aspects must necessarily be largely influenced by those with whom we have most intimate trade relations. Therefore should not this question of our future trade relations possess an interest for architects, builders, and indeed citizens of every class ?

The Slate Industry.

Several years ago one of the few slate quarries then in operation in Canada, was closed down because a profitable market could not be found for the output. The Canadian market had been made a dumping ground for the product of United States quarries, for which there was not sufficient home demand, and prices were cut so close that there was no money in the business for anybody. Now the conditions are very different. The United States market largely absorbs the output of the quarries, and British importers who formerly got their supplies from that source are trying to buy in Canada. This would therefore seem to be a favourable time to revive the manufacture of slates on a larger scale in this country and especially in view of the assured increase in the home demand arising from the rapid growth of our population.

The Dominion Exhibition.

The extensive and interesting display of natural and manufactured products of all kinds shown at the Exhibition which has just closed in Toronto, taken in conjunction with the great improvements made to the buildings and grounds fully warranted the more ambitious title of Dominion Exhibition employed by the management this year. From an architectural standpoint the Exhibition has been rendered much more satisfactory by the erection in permanent material: of a number of well designed buildings, such as the Art Gallery, Manufacturers' Building, Stove Building, etc., and the removal of many small structures which gave to the grounds a crowded appearance. With these out of the way the grounds convey an impression of spaciousness which greatly enhances the appearance of the principal buildings and satisfies the eye. The Stove Building, a substantial brick structure, has already proved inadequate for its purpose. While there was an exceptionally good display of heating apparatus by the various Canadian manufacturers, the exhibit would have been still more representative had the necessary space been available. It seems unfortunate that in planning this building provision was not made for the larger requirements of the future.

In keeping with the permanent character of the new buildings, the exhibits were on a larger and more varied scale than ever before, and received greater attention from visitors. The exemplification of manufacturing processes was a new and instructive feature, and the high quality of the finished products marked "made in Canada," should tend to dispel the too largely prevalent notion that for goods of the highest quality one must purchase from foreign makers. The expense and care bestowed on the arrangement of the exhibits is deserving of praise and gave to this year's Exhibition a refinement in pleasing contrast to the crude results of earlier efforts. In this respect we have no doubt learned profitable lessons from the larger exhibitions in the United States. It is gratifying to know that we have reached a point in our national development where there is demand for beauty as well as utility. This demand is likely to be stimulated by a sight of the many beautiful examples of artistic workmanship comprising the collection of Jubilee presents, the loving tribute to Queen Victoria from her subjects in all parts of the Empire. The Canadian people are under a debt of gratitude to King Edward for the kind consideration which prompted him to allow this valuable treasure to be brought to Canada and placed on public exhibition. The enterprise of the exhibition management in securing such an interesting feature is also deserving of recognition.

Building Conditions

The recently published statement showing the value of building operations in Toronto for the first half of the present year to be considerably in excess of the corresponding months of last year, came as a surprise even to persons most closely identified with the building industry. The opinion prevailed that owing to the long continued strikes the showing would be a bad one. The great scarcity of houses for rent in Toronto has compelled many persons to build, notwithstanding the high cost, and has induced a considerable amount of speculative building of houses of a fairly substantial character. It is in this direction that the greatest volume of building has been done this year. Apart from a number of new factories very few important buildings of a commercial or public character are in process of construction. The high prices of materials and labor coupled with unsettled labor conditions in Toronto led to the abandonment for the present of several costly undertakings. One regrettable feature of the situation is that owing to changed conditions some of these projects may never be carried out. In Montreal as in Toronto the demand for houses is very active, with corresponding activity in building. The suburban real estate sold during the month of July amounted in value to $180,989 and in the city proper to $732,838. The value of building permits for the month named was $533,247. Reports from Winnipeg and other cities indicate that the building operations will probably exceed those of any previous year. Satisfactory as are the existing conditions, reflecting a high state of prosperity, they would have been much more so, had it not been for the uncertainty and delay caused by labor troubles.

It has been estimated that the aggregate cost of large buildings in South Africa now in process of construction or under consideration is about $100,000,000, one half of this amount being for government work. The general tendency is not to be sparing as to the additional expense necessary to insure stability and comfort by the adoption of the most approved modern systems. A suggestion has been made for the establishment by English manufacturers of central depots at Cape Town and Durban, where stocks of heavy building materials would be carried. In the present state of affairs in South Africa there is a marked preference for constructional supplies available for immediate delivery. The results of similar arrangements in other branches of trade seem favorable to the development of this new project.

NOTES OF TRAVEL.—IV.

The Guild of Handicraft.

An actual, practical, going concern, devoted to handicraft as opposed to machine workmanship is worth visiting, and, as the new home of the Guild of Handicraft came by my way, I turned aside for a couple of days to visit it.

The Guild of Handicraft originated in an educational effort in East London. It began with classes for the study of design and the reading of Ruskin, carried on by the Guild's present head, Mr. C. R. Ashbee, at Toynbee Hall, the University settlement in East London. This was in the years 1886 and 1887. Reading led to designing, and designing to its application in practice, all in a small way at first. From this gradually grew a school in connection with a workshop, with the men in the workshop teachers in the school and the pupils in the school becoming gradually drafted into the workshop. When the Guild of three members had a school of fifty members, the indefatigable English benevolent subscribers stepped in—and here the story ends as an example of anything that would be possible in Canada. Funds were provided to carry the school through two trial years, on the top floor of a warehouse which became the school and workshop combined.

The school continued for nine years before it was extinguished by the State-aided competition of the London County Council Technical Schools. In the meantime it had not only had 700 pupils pass through its hands but had strengthened the Guild by the addition of a dozen or so of members, and their work was in demand. Beginning with wood and sheet metal work, they had added other works; they established themselves at Essex House, an old house in the East End, and became an established company of co-operative, autonomous workmen. Organization was in the hands of a committee; the committee elected a manager, who had a free hand in workshop discipline, but the individual guildsman had a right to lay his case before the committee. Such a thing as a real labor dispute is said to have never happened, and the value of the committee as a means of education, in the way of a sense of responsibility, steady and good work—in fact in the cultivation of a corporate conscience—is said to have been immense. The bonus at the end of the year is said to far outweigh, in the added sense of responsibility it gives, its actual cash value: Mr. Ashbee says "we have never found that the actual bonus made much difference; it is always the theoretical bonus that does the work."

Wages are paid on the basis of the Trade Union rate, wherever there is one, and the principle of inequality in human values is added. If, as sometimes happens, the Trade Union rate, in any individual case, is found to be in excess of the man's market value, the matter is settled by the manager and the Guild Committee in consultation.

It only remains, to complete the history of the Guild, to say that they are now a limited liability company, retaining as far as possible the good points of their original constitution. The workshop committee is still there, and the right of appeal from it to the manager; the committee does not, however, now elect the manager, which is done by the board of directors, but it sends a labor director to the board that does so.

A year and a half ago the Guild, finding itself enlarging to the point when expansion was inevitable, and as London is not an easy place to expand in, made what to an onlooker seems its happiest move, in establishing itself in the country. Having found in Campden, in Gloucestershire, a decayed town, with houses to be got for the workmen, it moved there about a year and a half ago.

High Street, Campden.

Campden, at the centre of the Cotswold wool growing district, was a great wool weaving town in the

A House in Campden.

fifteenth century and later. The old buildings remain—a fine church, some gothic houses, and some of

Renaissance periods ; all of stone. Mr. Ashbee himself possesses a house which contained the old wool merchants' hall, and he thus has a sitting room with a black timbered roof. The Guild workshop is an old stone silk mill in a garden—mill and residence one building, as was the happy way in those days. They have built a machine house with a gas engine and dynamos, for electric lighting and what machinery they use for preparing their wood ; the smithy is also out of doors ; for the rest the three floors of the woolen mill suffice for their several works which comprise, besides the blacksmithing : joinery, wood carving, metal work in silver and brass, jewel making, enamel working, printing and bookbinding. The clink of hammer and

The Guild Workshops, Campden.

metal, which one hears in approaching, strikes an ear, which is accustomed to the sound of machinery in such a building, with a sort of quaintness, analogous to the small scale of old buildings beside the new. Inside there is also a noticeable difference. Instead of a number of mechanics doing the same thing over and over again, and that only a step on the way to something they never know what, every man is here doing a piece of work which is usually his own from beginning to end; if not, it is only, as in the case of the carver, that his work finds its application in work that is done by other hands, and he is at any rate in touch with the work to which it is applied. This is a happy condition and it is no affectation to say that this workshop affects one's spirits pleasantly, whereas a machine shop suggests nothing but working between whistles; a terrible treadmill to which men have doomed themselves, as a consequence of mating. Here the Guild of Handicraft decidedly scores. The cant phrase, that art is the "expression of the workman's joy in his work," has here a chance of exemplification; a man may be interested in his work as well as in his wife. By so much more also that the work is done in a garden, and the air is fresh.

As to the work:—the blacksmithing is of course exactly what blacksmithing should be; a set of Guild fire irons (which, by the way, showed no loving marks of the hammer, but had a sort of lovingness in the soft section of the twist and in a certain whitey blackness of color) would be a pleasure to see—and to use. The smiths are also making electric fixtures which promise to be elegant, though iron. The snakey tendrils of the "pine apple pattern" come in well here. The trail of this serpent is over the work of the Guild. They have also come under the influence of Burne Jones' sinuous female with the high navel. In fact there is a school mark upon their work that seems to be conscious, and intended to suit a market that asks for the kind of thing. In their silver vessels—all of which are beaten out of the sheet metal—the hammer marks remain, because they say people like them so. Their silver work is certainly fine and is more substantial than spun silver. The hammer marks are very slight; not made for effect, but merely left, when the form is perfected, without further work; and the result is a sort of richness of surface; nevertheless, as these marks could be removed by further hammering, the dignity of a silver chalice seems to require that they should be removed. There is no particular virtue in the marks of the workman's hand, except as a trademark of the school that does handwork in an age when machine work is the rule.

Of the same kind is the square edged joinery of this school, which, I confess, bores me. If our rude forefathers did not know enough to mould, we do. There is something tiresome about this inability to adopt the method of good old work without adopting its manner too.

There is the same snare evident in the work of the hand printers. William Morris was not really a reformer in this respect. The Kelmscott Press was only an expression of discontent with the present; expressed by reverting to the past. But that sort of past is past. There is a clear field yet for any one who has been infected with the discontent and would allay it by creating a type with the beauty of usefulness. It is not necessary to create; the earliest printing, earlier than the period Morris preferred, has all the qualities of design combined with perfect legibility. Some of the publications of the Guild of Handicraft are printed in this type, making a perfect book. It is to be hoped that the Guild will be content to shine by this simple excellence. But the market for fine books is the market of the connoisseur and collector, perverted beings who from seeking the peculiarity of goodness have come to seek peculiarity as in itself goodness. The hand printer therefore finds it wise to make sure of his market by designing a special type which will mark the work of his own press; but to design a type that will have special peculiarities, and yet be as simple as the best type—which is the simplest—is a feat which will task even such an accomplished designer as Mr. Ashbee.

The Guild seems to have secured a field to itself in jewelry of modern design. There is a staff of men constantly employed supplying the Guild shop in Bond street, where the jewelry which is displayed makes a very attractive window.

They do also some good enamelling—a seductive looking work as applied to decorative landscape. It is simply glass dust floated on metal and fused in a furnace. Here is the principal difficulty, as the colour, without which the work is nothing, depends upon judgment as to the length of exposure in the furnace.

The great satisfaction in working in the Guild workshop, must after all be that designing and execution are, if not always by the same hand, at any rate in such close contact and communication, and standing upon such equal ground, that the designer is really in touch with his material, and this makes designing a pleasure because it makes good design possible.

W. A. Langton.

BRIDGE FOR THE CANADIAN NIAGARA POWER COMPANY.

By Orrin E. Dunlap.

A bridge that is being built by the Queenston Quarry Company for the Canadian Niagara Power Company has several interesting features. The site of the bridge is in Queen Victoria Niagara Falls Free Park, and it is to span the canal inlet leading to the forebay in front of the power station of the Canadian Niagara Power Company. When completed it will be one of the links in a beautiful driveway along the upper Niagara

New Bridge for Canadian Niagara Power Company.

River on the Canadian side, a locality that is just at present undergoing numerous changes as a result of the extensive power development now taking place there. These changes call for many new features, and this bridge is one of them.

The bridge is to be a concrete-steel structure with stone facing, and in general appearance will resemble somewhat the new bridge erected some months ago between the mainland and Goat Island on the New York side of the river. The length of the bridge to end of posts will be 298 feet. There will be five spans, each of 50 feet, and they will have rises of five feet. The piers will be eight feet wide on the face of the bridge and 66 feet 3¾ inches long to outside of cutwaters. The piers are set on bedrock, necessitating four or five feet of excavation. The stone used in the bridge is from Queenston, Ont. The piers below the springing line are pointed. The belts, washes and the coping are all of fine dressed work. Steel ribs spaced three-foot centers will be imbedded in the concrete of the arches. Portland cement is being used exclusively on the work.

The width of the bridge is to be 55 feet over copings, except at the piers, where there is a projection of about a foot, making the width of the bridge at the widest part about 57 feet. Inside of the copings the width is 52 feet, and of this 26 feet is to be devoted to double tracks of the Niagara Falls Park & River Railway, an electric line that skirts the river on the Canadian side, 20 feet to the driveway, and six feet on one side to a granolithic walk. The roadway is likely to be of porous gravel or cinders finished with macadam. The grade of the roadway will be practically level, the gutters being graded from the center of each arch to the piers, catch-basins being placed over each pier. Drainage is provided to be carried off in cast iron pipes that will discharge at about the springing line of the arch. It may be pointed out that the arches were made of such small rise in order to avoid raising the railway tracks, which will be on a fill approaching the bridge. The abutments of the structure are built of concrete in which large stones are imbedded. A conduit having four compartments has been built in the sidewalk for carrying electric wires for lighting the bridge, a pipe being inserted in each of the main posts. The specifications call for a loading of 5,000 lbs. per lineal foot on one track of the railway, and 100 lbs. per square foot on the driveway.

The arches and backing of the spandrel walls and the piers above springing line, are to be built of Portland cement concrete, the proportions of which are to be one part cement, two parts sand and four parts broken stone. In the piers below the springing line the proportions of the concrete are to be one part cement, three parts sand and six parts broken stone. In the construction of the bridge the contractor is required to trowel two inches of mortar onto the lagging in order to give a smooth surface on the concrete of the soffit of the arch. In building, the contractor is required to start the concrete simultaneously from the ends of the arch and lay it in longitudinal sections. While being built, timber forms hold the sections in place. The tops of the arches and backs of the spandrel walls are to be given two coats of pure Portland cement grout applied with brushes and then covered with two thicknesses of felt. This is in order that the arches may be made waterproof so that the dampness will not come through and stain the masonry.

Before the construction of the bridge a coffer-dam was built between the site and the waters of the river. The water that will pass beneath the bridge will flow to the turbines in the wheel-pit of the Canadian Niagara Power Company. High water will be 1.37 ft. above the springing line of the arch, which will be a depth of 17 9-10 ft. of water in the inlet canal. Low water will be 3.93 ft. below the springing line of the arch, or a depth of 12 6-10 ft. of water in the canal, while the mean stage of water will be 1.83 ft. below the springing line, or a depth of 14 7-10 ft. in the canal.

This beautiful bridge was designed by William A.

New Bridge for Canadian Niagara Power Company.

Brackenridge, one of the consulting engineers of the Canadian Niagara Power Company, and the structure is being built under the direction of Cecil B. Smith, resident engineer of the Canadian Niagara Power Company. It is without doubt to be one of the most beautiful bridges on the Canadian side at Niagara, and will be a material factor in adding to the new beauty of Victoria Park. Its magnificent lines and fine appearance will go well toward showing that even though industry has invaded the Canadian pleasure ground at Niagara, it is the intention of the park commissioners, and also of the Canadian Niagara Power Company, so far as it is concerned, to do nothing that will mar the natural beauty of the surroundings of the falls.

DETAILS OF MODERN HOSPITAL DESIGN.*

By A. Saxon Snell, F.R.I.B.A.

Under the title of "Details of a Hospital Ward," Mr. Snell spoke of some old principles of ward construction which ought not to be forgotten There is a tendency to consult new ideas at the cost of neglecting certain important sanitary principles. The author refers to several instances of new wards constructed upon the latest principles which have proved unsuccessful. As he says: "The old wards were known to be dangerously unclean, and special precautions were therefore taken to counteract their condition. The new wards were so very bright and clean that anything but perfunctory cleaning was scarcely thought necessary. In the old wards (which were dangerously unclean) the windows were kept open, and the very walls, innocent of plaster, were porous enough to be an assistance to ventilation. In their view it appeared that the provision of air inlets was thought to obviate the necessity of opening the windows." Another example of the neglect of well-worn principles is given. "The drainage of a certain building was relaid upon modern principles with manholes at every branch and change of direction. The old drains were always flushed periodically, and thus kept fairly clean. The new drains were supposed to act for ever without such assistance." The author says, five years after they were laid he made an examination of the system, "and was compelled to use a crowbar to open the covers of the manholes, which had never been touched since the drains were first laid." These are instances of the adoption of new methods of inspection which are never properly utilized. In another case the inlet ventilators of a ward were expensively constructed with glazed pipes. On visiting the hospital a year afterwards he found those flues black with dirt. They were never cleaned. Everyone knows it is an accepted principle of ward construction that all angles and corners should be rounded, so as to avoid all sharp angles and deep-cut mouldings where dust and dirt can lodge, and yet this principle is often subverted by the adoption of methods of flooring which harbor disease germs. The insistance of floors of smooth and impervious materials free from holes or crevices is one that cannot be exaggerated. Therefore, the author says plain-jointed soft wood floors are objectionable, as such wood shrinks, and thus leave joints for the secretion of dust and dirt, and are, moreover, absorbent. Speaking of hard wood floors, Mr. Snell has been in the habit of adopting kiln-dried maple in narrow widths, which is an "exceedingly hard and unwearable floor, its light color showing up dust more readily than dark woods." Oak and teak are commonly used, and the author says the terrazzo floors are advocated on account of their impermeability, though this is questionable, he thinks, when the high polish is worn off the cement. Asphalte is also useful, but its dark color is against it. As for finishing wooden floors beeswax and turpentine are recommended. The author speaks also of the importance of well rounding the angle between floor and skirting, a radius of 2½in. to 3in. being used; but Mr. Snell thinks 1¼in. radius enough, and this hollow or rounding must be formed of the same material as the floor. Sometimes hollow bricks are used for the hollowing, but the joints are numerous. On the question of wall surfaces the author does not discuss the advantages of either the porous or impermeable wall. Hygienically, we should prefer for hospital walls the cavity principle of construction, with materials sufficiently permeable to allow a degree of transpiration; but modern hospital practice has adopted the impervious walls, and the object aimed at is to make the interior wall surfaces as smooth and hard as possible, so as not to retain dust, and to be capable of easy cleaning. The germ theory is accountable for this view as well as for other modern ideas of construction, such as the rounded corners and angles. The hospital ward is often lined with tiles which make an impervious and clean surface; but practically the numerous joints are against it. A more perfect and smooth surface may be insured by a trowelled cement surface painted with enamel paint. Mr. Snell says: "It is scarcely possible to obtain a more generally smooth surface than trowelled cement—Keene's or Sirapite. These can be brought to a polished surface. It is difficult, if not impossible, however, to obtain a really even color. Although enamel paint can be used with decorative effect, pictures would still be required to decorate the walls, and the ordinary framed picture is a veritable dust trap. Therein tiled surfaces have the advantage of painted walls, as they can be decorated with permanent pictures painted on the surface. . . It would be possible to cover permanent wall paintings with glass let in flush with the wall surface, and I am not sure that this has not been done." There is an important suggestion here. We believe that for ordinary wards, painted tiled pictures of a quiet character and tone could be one of the best substitutes; a better would be panels high up or introduced in a deep frieze painted in distemper. We believe pictures can be fixed to the cement surface, and then covered as suggested by glass or enamelled, so as not to harbor dust, and be washable. A bare blank wall surface, even if colored a nice grey or in quiet tones of green, is monotonous if not relieved by pictures or prints, which appear to be necessary for the eyes of patients of an artistic temperament. The question is one that may well be considered by hygienists and architects engaged in hospital building. Ceilings are suggested to be best painted and non-porous; there are several kinds of paints in the market that may be used; and other appliances, like thin enamelled metal that can be bent easily, have been used. Touching the important question of windows, little definite information is given. The ordinary sash window, with a hopper and spandrel sides to prevent down-draught, is perhaps the simplest mode, and the author thinks that casement windows with solid frames are not open to the objection of angles, crevices, etc., involved in the sash window. At Willesden Parish Infirmary the author has used casement windows brought down to within 12 in. of the floor, and with hopper next the ceiling. The casements open inwards, and form a protection for the bed, and by opening them the wards can be flooded with air. At the Charing-Cross Hospital Mr. Snell is adopting the "Middlesex" windows, which include five sashes of equal size in the height, all of which, excepting the lowest, are hung on centres and controlled by one rod or lever. The sashes close one upon another, and there are no transoms. The lowest sash is hung on the bottom rail. The advantage of this form of window is that it can be opened to a larger extent than the ordinary sash window. All except the controlling lever is fixed on the outside of window, and if the glass can be fixed flush with the inner surface of sashes, it is desirable. For doors, hardwood, of course, is adopted, oiled or polished. Enamel paint is also a good substitute. Architects engaged in this class of building are naturally looking for doors without panels, which give a lodgment for dust and dirt. The flush panel doors are a step in the right direction, but the joints open and become crevices for dust. The author then refers to Canadian doors made up of small sections of solid soft wood, very closely fitted together and sheathed with hard wood, dovetailed on the whole, and pressed by hydraulic machinery. A flush-panelled soft-wood door, veneered with thin oak, seems to be all that is desirable, or a thin metal-cased door. In the fittings and furniture of wards the observance of the principles of smoothness, freedom from crevices, and projecting parts is quite as important. The author mentions some improvements in bedside lockers. The tops are now made of glass or marmorite, which is a valuable substitute for glass, and there are no unnecessary joints or crevices, and the whole can be cleaned. As for cupboards, they are certainly objectionable in wards, as they foster concealment of various things. A closed cupboard is used for holding surgical and medical appliances, medicines, &c.; but these should be placed, we certainly agree, not against the wall but in the centre of ward, and the cupboard should be made of hard wood framed and glazed all round, and have glass shelves. Heavy tables and chairs, so charming to the artistic instinct, are shunned by the hospital expert. Stoves are numerous, those made of iron plates and grills and moulded are not recommended; those built up with firebrick and tiles are preferred, as they are cleaner and better radiators. As to the important questions of heating and ventilation, nothing is suggested except that all pipes and fittings should be arranged so as to be easily kept clean; that controlling valves, etc., be kept out of ward; and that all flues with movable gratings in floors or walls, should be made easy of access for disinfection and cleaning. Mr. Snell refers to the deceptive and objectionable character of many sinks and basins on the market designed for hospitals which are made with glazed surfaces and rounded angles on the top and sides, but are death-traps underneath, full of pockets never likely to be cleaned.

*Abstract of Paper read before the British Sanitary Institute Congress, Bradford, England.

FIRE RETARDING WINDOWS.

The introduction to the report of the British Fire Prevention Committee on fire tests with prism glass reads as follows: "We have for a considerable time been applying various forms of 'fire resisting' construction, and various materials for the separation of fire risks, but we have somehow neglected the very necessary precaution of protecting such openings as have to admit light, and through which the spread of fire may involve an entire building.

"In the case of houses facing one another, in respect to buildings overlooking mutual areas, dormers overlooking adjoining roofs, and in many other instances where the separation of adjoining risks is all-important, protection of shutters and blinds had frequently been advocated, but the counter-argument has always been that shutters will not work in an emergency, or that their presence is entirely forgotten in the hour of need. As far as internal glass partitions, fanlights, glass panels to doors, etc., are concerned, nothing has practically been suggested, and hence there have been no arguments one way or the other on these points.

"It has been discovered by sheer accident, I believe, that, by adopting special methods of glazing glass, plain, plate or prismatic, will withstand a high temperature, and the application of water, and it is urged that by adopting such methods of glazing there will be no necessity for the shutter or the blind, inasmuch as the window or skylight will in itself afford considerable protection.

"The report which we now publish, and which gives particulars of the committee's official test with some glazing of this description, speaks for itself. The glass in this case was prismatic glass, but similar investigations will yet be held with plain glass and with plate glass, where this method of glazing is adopted.

"With plain glass and plate glass light, will, of course, be introduced in the ordinary manner, but with the prisms, light can be reflected into special directions and the lightness of a room enhanced.

"It is indeed interesting to have to consider a form of glazing which, besides being fire-retardant, is intended to enhance the lightness of a room, and the executive fully appreciate the importance and significance of their tests with this method of construction, inasmuch as the facts obtained should materially influence the reduction of the fire risk of the metropolis in a direction that has not yet been tried."

In the report of the National Fire Protection Committee of America the last paragraph in regard to glass fire retardents reads as follows:

"Your committee would recommend that the investigation as to the fire-retarding qualities of electro-glazed windows, and especially of luxfer prisms in electro-glazed frames, be continued, as results of fire tests, so far as noted, would indicate that in good fireproof window frames, and possibly with glass units reduced in size, electro-glazed windows may be useful under certain conditions as fire retardants. A fire-retarding window which at the same time is useful for proper distribution of light would be of value in a great number of instances."

Mr. E. U. Crosby, in his report to the National Fire Protection Association on the subject of light wells and other vertical hazards, includes the following among his conclusions:

(a) There should be no light wells; the loss of illumination due to abandonment of the light well can be more than made up by proper use of luxfer prism glass in wall windows, helped out in especially deep or angular buildings by the modern artificial white lights.

(b) Where such a well is allowed to exist it should be cut off from connection with each story with prism glass partitions set in non combustible frames, permanently secured in position. First story to be shut off from wall by a similar horizontal partition at ceiling level.

The right place for a fire escape is not right in line with window fronts, but on a blind wall, with connecting approaches or bridges.—Fireproof.

Messrs. D. H. Burnam & Co., the well-known firm of architects of Chicago, are said to have employed a staff of ninety men and are only prevented from employing a greater number by lack of office accommodation.

A NOVEL SUGGESTION.

We have heard a great deal in recent years about the smoke nuisance, as relating to industrial works. Some cities, including Montreal, have passed by-laws providing for the compulsory use of smoke consumers, which, if of doubtful value to the citizens at large, have been a source of profit to inventors and manufacturers of devices intended to burn or otherwise get rid of the smoke which constitutes a nuisance and a detriment to health when emitted into the atmosphere via the factory chimney. It remains for an associate member of the British Institute of Civil Engineers, Mr. G. T. Beilby, in a recent paper, to direct public attention to a new phase of this subject, viz., smoke abatement as applied to houses. Mr. Beilby estimates that in Great Britain 36,000,000 tons of coal are consumed annually in about 8,000,000 inhabited houses, and calls attention to the fact which probably nobody would dispute, that the domestic grate is at the mercy of a larger and more varied selection of incompetent stokers than any other coal-consuming appliance. As the only feasible means for abating this phase of the smoke nuisance, this author suggests that a chimney tax might be so applied as to stimulate and bring about the widest and most radical improvement in domestic heating. His plan would be to tax every chimney which is sufficiently wide to vent the products from the burning of raw coal, and leave free all those which are too small to do this. "This would at once place a premium on the use of smokeless fuel, as gas and coke can be satisfactorily burnt with very narrow chimneys. The production of these forms of fuel would be enormously stimulated, and the devising of appliances for their combustion would be encouraged. The architect and the engineer would have a new and fruitful field for their ingenuity and skill, and their trained efforts would in a short time greatly advance our practical knowledge of the subject."

"At present," remarked Mr. Beilby, "the 9 in. chimney holds absolute sway, and a house built without its full complement of these chimneys is looked on as abnormal and outside of the ordinary practice of those who buy and sell or who lend money on house property. The builder, therefore, declines to build houses which are really adapted for smokeless firing by gas or coke, with the result that these fuels have never had a chance of showing at their best." It is estimated that a tax of one shilling per chimney would yield a revenue of £800,000. Mr. Beilby's suggestion is an ingenious one, but it may safely be predicted that no attempt is likely to be made to put his ideas into practice. In Canada the general use of bituminous coal and the most approved devices for cooking and heating reduces to a minimum the amount of smoke discharged into the atmosphere. Here the necessity for ample size flues in chimneys must be urged, the tendency of builders being to make the area of the chimney too small, with the object in some cases, no doubt, of saving a little material.

The death is announced in Switzerland of Mr. Geo. F. Shepley, the well known American architect. Mr. Shepley was born in St. Louis in 1860, and received his professional education in Boston, being a graduate of the Massachusetts Institute of Technology. He entered the office of H. H. Richardson and on the death of the latter continued the business in partnership with Mr. Coolidge and Mr. Rutan who has been for many years connected with the office. The firm gained a distinguished place among the leading architects of the United States and carried out many important works.

ANCIENT LIGHTS.

The Ancient Lights Bill, the result of the labours of a joint committee of the Royal Institute of British Architects and the Surveyors' Institution, has been introduced by Mr. Fletcher Moulton, K.C., Mr. Robson, Mr. H. D. Greene, and Mr. Herbert Robertson, and was read a first time in the House of Commons on June 22; but, unfortunately in the present congested state of business, says The Building News, so useful and practical a reform has no chance of becoming law. The measure has as its full title, "An Act for Amending the Law Relating to Easements of Light," and it consists of eight parts and some twenty-seven clauses. Part I. provides that its operation is to be restricted to England and Wales, and Part II. consists of half a dozen definitions. Part III. deals with the limitations of the amount of light of a dominant owner, and Part IV. provides for the obstruction of an accruing light easement by notice in place of the existing clumsy mode of physical obstruction. Part V. provides that no title by presumption shall be acquired to light passing over a tenement on the opposite side of a street. Part VI. makes elaborate provisions for certificated plans of buildings about to be taken down, which will be a great interest to "official surveyors," by which term are described district surveyors in London, and county or borough surveyors elsewhere. Part VII. regulates the the statement of claims arising out of rights to light, and is the most verbose of all, and Part IX. provides for the construction of a tribunal of appeal, consisting of nine members, to be appointed in equal proportions by the Secretary of State, the R.I.B.A. Council, and the Surveyors' Institution Council.

NOTES.

The fire-escape, as ordinary built, is the ladder of flame.—Fireproof.

"None of the best headwork in art, literature or science, is ever paid for."—Ruskin.

"All good architecture is the expression of national life and character."—Ruskin.

"They say every man is the architect of his own fortune."

"That may be so, but usually he can't get intelligent contractors to carry out his ideas."

There is said to be a good demand in South Africa for good draughtsmen and architects' assistants, but not for architects wishing to engage in practice. Of these there are said to be many men already on the spot who are familiar with all local conditions, having been in practice before the war, and who therefore have much advantage above outsiders.

In answer to a correspondent who asks "what would be a safe load on solid concrete columns (composed of broken brick and cement) 13 ft. high and of 14 in. average diameter?" the London Builders' Record gives the following: If composed of 1 part of good Portland cement, 4 of hard-burnt brick, and 1 of clean sand, a safe load would be 10 tons; though concrete columns of the size stated ought to sustain 40 tons before they failed.

There was recently unveiled in Paris by the Minister of Public Instruction, a marble monument to Charles Garnier, architect of the Grand Opera House in that city. The monument is placed in an outer angle of the Opera House, and is, as it were, a signature upon the building. Upon the pedestal is traced a plan of the Opera. This is surmounted by the bust of the great architect, flanked by figures in bronze symbolical of Fame and the Graphic Arts. Charles Garnier was the son of a blacksmith. He was born in Paris in 1825, and at an early age showed an aptitude for drawing. When a young and obscure architect, he easily won first place in the competition for designs for the Paris Opera House, which is his best monument.

THE SCIENTIFIC BASIS AND COMMERCIAL FEASIBILITY OF HEAT RADIATORS, USING AIR INSTEAD OF WATER OR STEAM.*

By George M. Aylsworth M.D., Collingwood, Canada.

In the past many have thought that air could be used in radiators instead of water for the distribution of heat, and about twenty years ago a U.S. patent was issued covering the point.

The scheme, however, proved a complete failure owing to the radiator being simply a square box many times the capacity of the conducting pipes. The current of air was so rapid that it passed through this box radiator in a straight line and an enormously large proportion of the air in the box was not changed in temperature at all. As a consequence the hot air parted with but a small percentage of its heat, while passing through this box form of radiator. The general appearance and construction of the radiator is shown in Figure 1. The scientific reasons for the adoption of its peculiar form and the use of thin sheet metal in its construction are as follows:

The conditions requiring to be met were a distributing agent that would make the circuit of the furnace and radiators many times while water was making a similar circuit once. At the same time, the rapidly moving air would absorb much less heat from the furnace, bulk for bulk, than the slower moving water.

The problem therefore was to evolve a radiator that would compel the air passing through it to part with all or nearly all of its heat to the air of a room without diminishing the rapidity of the travel of the confined air.

The problem has been solved by the adoption of four devices.

Fig. 1.

First, by increasing the distance the air has to travel within a short space.

This was accomplished by the up and down or to and fro course the air is compelled to take in passing through the radiator. The distance from the centre of the inflow pipe to the centre of the outflow pipe is 2 feet, while the air travels in the radiator four and a half times as far, or an average of 9 feet.

Second, by offering the least possible obstruction to the passage of the heat from the air within the radiator to the air outside the radiator, but within the room.

This was accomplished by using sheet metal as thin as is consistent with rigidity.

Third, by compelling the volume of air to spread out into thin sheets so that all of it while passing through a radiator, should be kept as nearly as possible in contact with the enclosing metal.

This is accomplished by having the conduit through each section of the radiator, 1 x 7 inches rectangular in form, instead of round or square. The method of piping consists in having the area of the conducting pipe equal to the areas of the conduit or conduits in the radiator or radiators served by it. Also in having the volume of air necessary to serve a radiator, whether it have one or more sections, conveyed to the radiator in a single round or square column.

It will be noted that this method causes the difference between the circumference of the supply pipe and the conduits in the radiator to increase with each section that is added to it. The conduit in a single section has nearly double the circumference of its round supply pipe, while the conduits in a four-section radiator have three and one-half times the circumference of its round supply pipe.

The conducting pipes of a single section are round 3-inch pipes having a circumference of 9 inches and an area of 7 square inches, while the conduit through the section has a circumference

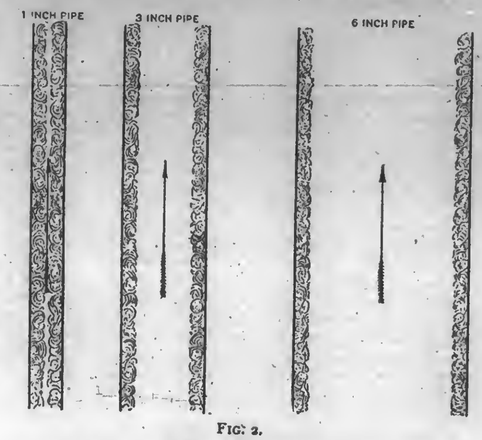

Fig. 2.

of 16 inches and an area of 7 square inches, or the same area as its supply pipe.

A four-section radiator is served by a 6-inch round conducting pipe, having a circumference of 18 inches and an area of 28 square inches, while the sum of the circumferences of the four conduits is 64 inches and the sum of their areas is 28 square inches, or the same as their 6-inch conducting pipes.

The extremely flat shape of the conduit through a radiator also prevents any part of the air it contains getting more than half an inch from the enclosing metal, while the centre of the air current through a 3-inch round pipe is 1½ inches away from the containing metal or three times the distance, and in a 6-inch round pipe, 3 inches or six times as far from the metal, and so with each change in the number of the sections in a radiator.

It is a well-known fact, which can be confirmed by observation

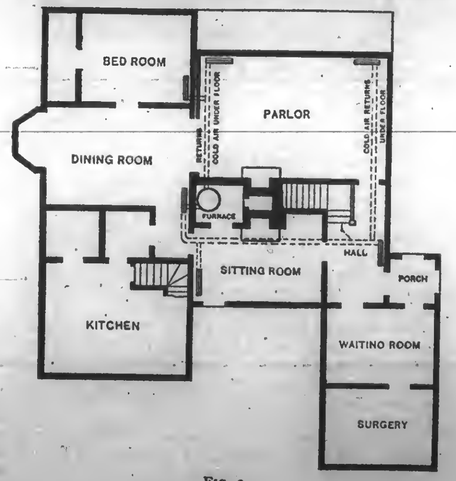

Fig. 3.

of any stream of water, that fluid in contact with the wall of a pipe, on account of the friction, takes on a revolving motion while passing through it, but the whole area of the current does not partake of this revolving motion unless the pipe is extremely small. The part of the area of the current that is unaffected by this motion increases in proportion to the whole area of the pipe, provided the rapidity of the current remains the same. (See cut).

*(Presented by request at the Summer Meeting of the American Society of Heating and Ventilating Engineers, Niagara Falls, N.Y., 1903.)

this fact in connection with the other facts—that air cannot possibly get more than one-half inch from the confining metal when passing through one of these radiators, and can get from three to six times that distance from the metal in the pipes conducting the air to them—suggests the vast importance of the flattened conduit through the radiator.

Fourth, by facilitating convection; by which method, in order to heat a room, all the air in it must be repeatedly brought into contact with the outside surface of the metal in the radiator.

This is accomplished by the flat form of the sections, and where there is more than one section in a radiator, placing them side by side with nothing to obstruct the flow of air between them from below upwards, as heat is imparted to it from the hot air within the sections. The results obtained in the following experiments by the use of these radiators will be a surprise to those who have not studied the subject and they were a cause for astonishment to myself, their originator.

In February, 1902, I fitted up a house that was in process of erection with a discarded wood furnace and rough hand-made radiators. The house was isolated and consisted of a cellar, ground floor, first floor and attic, and contained on the ground floor and first floor, 18,000 cubic feet of space; the cellar had a foot of ice on its floor which was chopped away from the immediate neighborhood of the furnace. The house is now brick-clad, but at that time was neither lathed, plastered nor bricked, and had many openings, large and small, through the outside walls from the cellar to the attic as well as through the roof. Ten radiators were placed in position, nine on the ground and first

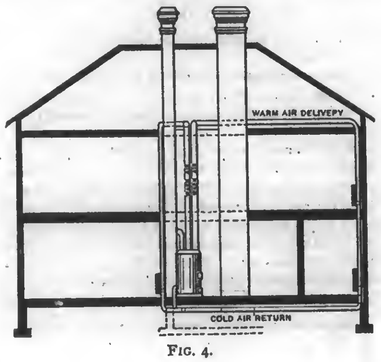

FIG. 4.

floor and one in the attic. A number accepted my invitation to visit the house on the afternoons of the 12th and 13th of the month. On the 12th, the outside temperature was 22 degrees Fahrenheit. On the 13th it was 12 degrees Fahrenheit, with moderate wind from the northwest. On each day all the radiators became warm within forty-five minutes after the fire was lighted. Two weeks later many of the openings had been covered with building paper preparatory to bricking the walls, the attic and cellar had been roughly shut off from the two floors, the house had been lathed with wet and frozen lath but not plastered, the temperature was 18 degrees Fahrenheit, with moderate west wind. The ground floor was brought to 63 degrees Fahrenheit within two hours after the fire was lighted. These results are phenomenal when we remember the wet lath and the enormous difficulty of heating a building when the plaster is wet, as pointed out by Mr. John Gormly at meeting last winter, in a paper entitled, "A time limit and dry walls necessary in testing a heating plant." The radiator in the attic was 20 feet horizontally and 20 feet perpendicularly distant from the furnace; it was the last of five on its main—two others having been supplied from the same pipe on each of the lower floors. The air entered this radiator at a temperature of 213 degrees Fahrenheit, and left it at 122 degrees Fahrenheit. Some of the heating experts present at this test believed, or at least said, while admitting the results, that the system would not stand a practical test of the many turns in the piping needed to place radiators at the points needed or preferred by house owners, nor would it succeed with the slower fire, as from anthracite coal.

To meet these objections, and having in the mean time had the radiators made in a presentable form, I fitted up my own house with them in 1903.

The house was an old-fashioned frame of two stories, the part served with radiators containing 17,000 cubic feet divided into ten rooms and two halls. There being no basement nor cellar, the furnace was set upon the ground floor and burned anthracite coal. It had never been repaired nor had its location been changed, although it had been in use for thirteen seasons. The ten radiators installed were supplied from three main pipes, two

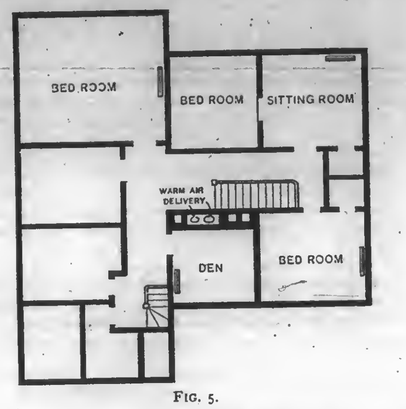

FIG. 5.

of these pipes conveyed the air through the attic before it reached any of the seven radiators; they served the ground and first floors; it was an overhead system, which it is hoped the accompanying plans will make clear.

The tinsmiths finished their work and a fire was lighted at 2 p.m. on the 19th of February. The next morning at 8 o'clock the temperature outdoors was 6 degrees Fahrenheit, and in the house it varied from 44 degrees to 60 degrees. The house was never as cold again, and after the first few days the system was better balanced and the variation within the house seldom exceeded 10 degrees, and only once did it reach 16 degrees, when the temperature outdoors was about 11 degrees, with a gale blowing from the northwest, the temperature within varied from 54 degrees to 70 degrees.

In passing from the furnace to two of the radiators, the hot air travels a distance of 62 and 71 feet, passing through the attic to

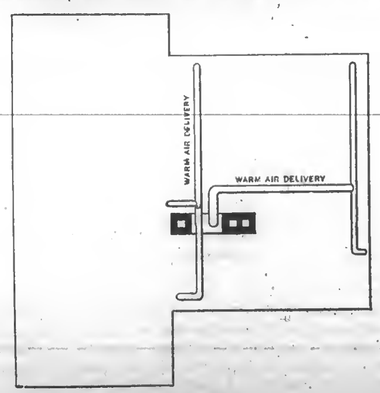

FIG. 6.

do so. In making the circuit from the furnace to these two radiators and back to the furnace, the air travels 107 feet and makes 13 turns, exclusive of the radiators, which if counted would make the air travel 116 feet with 21 turns, showing conclusively that turns in the piping have little or no effect upon the flow of air when it is confined and used in this way, and demonstrating how easily any probable conditions in any medium-sized building can be met with this system.

The foregoing results are much better than could be obtained with this furnace under the old system, for before the installation

of the radiators it had been found necessary, in order to get the same comfort, to supplement the furnace with two stoves and a large drum on the first floor. The latter utilized the heat from the smoke pipe of the furnace and it and the two stoves were done away with after the radiators were put in. Over and above this a very large percentage of the heat generated by the furnace is wasted, while the hot air is passing through the pipes in the attic before reaching the radiators. For the large amount of piping in the attic kept it at a higher temperature, notwithstanding attempts at insulation, than either of the lower floors, which of course was not the case before the radiators were used.

As to the consumption of fuel, it is impossible to be exact in connection with these experiments, but the quantity consumed during the two and one-half months the radiators were used would indicate that the present arrangement will not require more than the old one has done.

One of the reasons for uncertainty in estimating the consumption of fuel, in addition to the removal of the two stoves and heating drum aforementioned, is its rapid diminution, as the best method of running the furnace under the changed conditions was learned—for instance, two tons of coal were consumed in the first 18 days, a third ton in 11 days, or (omitting fractions) a ton every 11 days. A fourth ton was burned in 23 days, and a fifth in 18 days, or a ton every 20 days. That is an average per day of twice as much burned during the first 29 days than was burned

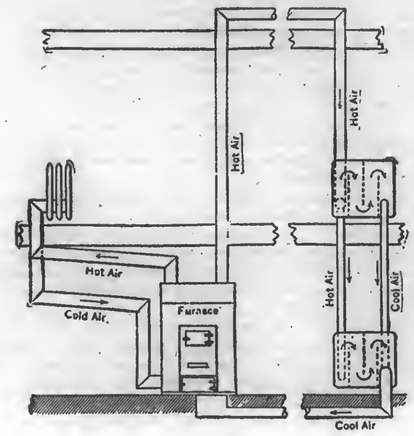

FIG. 7.

during the last 41 days, though the average was within a degree of being the same in each of the two periods with increased comfort during the latter. The rate at which the coal was consumed during the 41 days is almost identical with the rate of consumption in the past when registers were used.

The diameter of the fire pot in this instance is 18 inches, because the builders of the furnace claimed that that size pot was plenty large enough to heat 18,000 cubic feet. But this, as was not unusual in those days, was an overestimate, and at the present time it is unusual to find a reliable hot air furnace-maker making such a claim even when the familiar instructions—"Locate the furnace so that all hot air pipes shall be as short as possible" and "Place registers as close as possible to the furnace" are closely followed.

In this test of hot air radiators these rules have been purposely violated, and the departure from them is so wide that it is believed that 50 per cent. of the heat from the furnace is lost in transmission to and through the attic.

It is not anticipated that any one in his senses will adopt such an overhead system except under compulsion, neither can it be expected that the results under the conditions of this test should be ideal, yet they are the basis of the confidence felt that the proper installation of these hot air radiators will demonstrate beyond all question, during the coming winter, a decided economy in the consumption of fuel through their use.

DISCUSSION.

Secretary Mackay: Before starting a discussion I move a vote of thanks to Dr. Aylsworth for his courtesy in preparing this paper and presenting it to our Society. The motion was carried.

Prof. Kent: I notice that the rate of coal consumption is said to be the same as when registers were used, and would like to ask what is the advantage of this system?

Dr. Aylesworth: A large proportion of the heat was wasted—I estimate 50 per cent.—by passing through the attic, so that there was really more heat produced from the fuel.

Another advantage is that the air does not pass over the excessively hot surfaces of the furnace and then into the rooms, which is one of the points raised by steam and hot water advocates as an objection to the use of furnaces.

Mr. Switzer: Had you any supply of outside air?

Dr. Aylesworth: None whatever. My house has a large ventilating shaft, but there is no ventilation in connection with this air that passed through the radiators. The shaft passes between the two chimneys, up through the roof, forming a continual exhaust from the rooms; there are also two fireplaces on the ground floor.

Prof. Kent: How serious is the objection to having the air pass over the furnace in the usual way and be discharged into rooms?

Mr. Cobey: There is more or less objection to burning out certain elements of the air before we breathe it.

President Crane: The temperature given for the air passing into the radiator is 213 degrees, and that at the exit 123 degrees—a little hotter at the entrance and cooler at the exit than in a well balanced hot water apparatus, which is not commonly more than about 180 at the flow, with a diminution of about 15 degrees at the return.

Prof. Kent: This strikes me as a very well designed system for the results sought to be accomplished. Reducing the temperature from 213 to 123 shows an excellent design of the radiator, and the piping system must also be very well designed in order to avoid short-circuiting the air. In larger houses, with more branch pipes, I should expect more difficulty in circulating the air uniformly.

I do not see that pure air is hurt by passing over surfaces at 300 or 400 degrees. If it contains bacteria you may cook them and have a bad smell, but I think that is unimportant in practice.

A disadvantage of this system is that it does not ventilate as do other furnace systems, which is a strong argument in their favor.

This system would circulate just the same if the radiators were left out. The air would be discharged into the room, be breathed and returned to the furnace to be reheated. A disadvantage would be the possible leaks in the furnace.

Mr. Feldman: Dust contained in the air passed over a furnace is sometimes burned in cold weather, and can be smelled.

Mr. Roys: In an ordinary furnace-heated house the wind forces the heat to the other side of the house. In this case the circulation is not affected by the wind, which is a very great advantage.

Mr. Allen: In Fig. 4 the two circuits of pipe are shown as very unequal in length. I would ask if they are of the same size?

Dr. Aylesworth: No; the size of a pipe is governed by the amount of radiating surface it supplies.

Mr. Oldacre: How is the radiating surface proportioned to the contents and exposure of the rooms?

Dr. Aylesworth: The same as with steam or water.

Mr. Switzer: What is your source of air supply? If some of it escapes and the supply is insufficient to carry away the heat from the furnace, fuel would be wasted.

Moreover, it would shorten the life of the furnace to reduce the quantity of heat taken away from its surfaces.

Dr. Aylesworth: The system is not absolutely air tight any more than an ordinary furnace is. In practice, the furnace was used for two or three months and there was no perceptible loss of power, either by diminution of the volume of air or deterioration of its quality.

Mr. Oldacre: If in a furnace heated house one side is colder than the other the work is not properly done.

Secretary Mackay: I do not agree with Mr. Oldacre. I think that in 90 out of 100 cases the furnaces on the cold side of a building act as a cold air supply. I take it that the doctor heats his house more satisfactorily with the present system than he was able to before with the same furnace.

Mr. Chew: An ordinary furnace is to some extent preserved by the constant flow of cold air over its surfaces. In this case the

surfaces are exposed to what is comparatively a hot blast. The question is, how long will the furnace stand such treatment?

Mr. Cobey: I do not think a fire pot is more likely to be destroyed by passing 120 degree air over it than by air at zero, which is likely to disturb the iron by unequal contraction.

Mr. Chew: Moreover, to raise air from zero to 200 degrees the fire pot would have to be white hot, which would not be necessary if the return air is at 100.

Mr. Oldacre: I have never observed any deteriorating effect from cold air—even 10 below zero. The highest temperature of air discharged from a register, in very cold weather, was 190, which I consider too high, and that more air, at a lower temperature should be used—not above 150. The larger the volume of air the more nearly it approaches the quality of outside air.

Mr. Roys: I think Mr. Oldacre is speaking of an ideal system, while the Doctor is speaking of common practice. In my experience I find the air coming from registers as high as 400 degrees, and only getting down to 150 in mild weather.

Mr. Oldacre: Would not the casing of this furnace be so hot as to lose much heat in the cellar? When air is taken from outside the casing is so cool that you can put your hand on it. When I have found a hot casing it has indicated poor circulation, or some other trouble.

Mr. Roys: As a furnace is commonly installed it would often be impossible to even touch your hand to the top of the casing. I believe the fire underwriters say there are more fires caused by hot flues than any other cause.

Mr. Oldacre: I would like to have pointed out to me a single case where a house was set on fire by a hot pipe—I do not mean the chimney.

Mr. Roys: Mr. Sims, of the board of underwriters, claims that there are hundreds of such cases.

Mr. Switzer: I know of such a case. The wall pipe was not protected in any way and the pipe was air bound, so that it did not circulate. It was in 10 below zero weather, with a 30 mile gale forcing the air into the lower rooms, which grew colder, and this pipe to the second storey got hot enough to ignite the wood work

One of the objects of this society is to educate men to put in furnaces as perfectly as those Mr. Oldacre describes, which it is entirely possible to do.

Secretary Mackay: Dr. Aylesworth does not mention any valves or dampers to shut off the heat from a radiator. What effect would it have on the furnace to shut off one room or more?

Mr. Cobey; The system is in a primitive state, and the controlling appliances can easily be added. I think we shall some time adopt the direct radiation with separate provision for ventilation. I do not think it desirable to introduce the heat and the air for breathing through the same duct as it often gives a bad odor.

Mr. Schaffer: Answering a question of Mr. Chew, I will say that a furnace supplied with air from inside will last longer than if supplied with air from outside.

Prof. Kent: I would ask the size of these radiators.

Dr. Aylesworth: My present idea is to limit the radiators to four sections, of about 14 square feet of surface to the section.

In regard to heating the cold side of the house with these radiators, the colder the exposure the more rapid the circulation in the exposed radiator.

In regard to dampers, the instructions to the manufacturer who shipped this radiator here, were that he should put the damper in place, in the inflow pipe of the radiator, at the bottom. The effect of closing a damper would be the same as closing the register on any furnace, or any steam or water radiator.

For special ventilation it is planned to place another pipe outside of the exhaust pipe of the radiator, and connect it with the outdoor air.

Prof. Kent: I would ask how the Doctor gets a loss of half the heat in the attic?

Dr. Aylesworth: The attic covers the whole building, has roof exposure, and was kept warmer than the rooms below; there was a good deal of piping in it—the pipe, which is 10 in. at the start, runs 34 feet.

Prof. Kent: How would you change that in another building?

Dr. Aylesworth: Put the horizontal pipe below the floor.

Mr. Chew: I notice in Fig. 7 two systems of piping are shown; that at the right going up through the attic and that at the left being a direct flow pipe along the cellar ceiling, with a pipe up to the radiator and coming directly back. I would ask the Doctor's preference.

Dr. Aylesworth: It is decidedly preferable to carry the pipes through the cellar.

Mr. Oldacre: What are the advantages of this system over hot water or steam?

Dr. Aylesworth: It is cheaper to install and the expense of repairs is slight.

NORTHWEST LETTER.

(Special Correspondence of the CANADIAN ARCHITECT AND BUILDER.)

WINNIPEG, Sept. 9, 1903.

Although the building season here is not by any means closing in, yet all important work that is to be roofed before the hard frost comes is now well under way. The season has been a most satisfactory one from a builder's point of view and the amount of work that has been carried out is almost incredible compared with that done in former years. The great advance in prices both of material and labor this year would, it was expected, cause buildings to be cancelled to such an extent as to possibly retard the progress of the city, but contrary to expectation the quantity of work proceeded with has been so great that only by the united efforts of the contractors has it been successfully coped with.

Apart from the business blocks, warehouses, etc., the number of residences in course of construction is enormous, and although most of these are not of a very high order of architecture yet the relief they will give in this direction is most edifying. The better class of residences have been somewbat affected by the price of material and labor and in the way of intricate planning and elaborate finish and detail, they do not call forth much comment. The plans of most of these houses are carried out on the first principles of the square and the elevations have taken a correspondingly uninteresting position. To build with the least cost has been the ruling factor governing all this class of work. Several larger residences were contemplated early in the season but what was considered prohibitive prices caused the work to be postponed indefinitely.

The Steel Apartment Building, Portage Avenue, although not properly under the head of residences will ease the pressure to a considerable extent in the increasing demand for rooms. This is a six-storey building and on plan it is practically a square with a large central light well extending from the first floor to the roof. On each floor a gallery is carried around the well by which access is obtained to the different suites. The staircase and passenger elevator are taken up through the light well and connected directly with the several galleries. The single staircase appeals to one as rather a serious drawback to the satisfactory working of a building of this character, especially with the capacity this has of accomodating such a large number of people. A separate tradesmen's entrance and staircase would if arranged greatly facilitate matters and solve the problem of efficient service to the different floors. Each floor is divided into eight suites, each containing from three to five rooms with a bath room to every suite. A rather doubtful arrangement has, I think, been planned for the bath rooms and kitchens. These rooms are all lighted from the central light well, this light well itself being covered in with a skylight and rendered practically a closed area. In elevation the building is extremely simple; the material is buff pressed brick (Lac Du Bonnet) and Tyndall stone bands.

Apropos of residences, I am sending you for this issue of the CANADIAN ARCHITECT AND BUILDER a photograph of a summer house for Mr. R. Wilson. This house is beautifully situated on the bank of the Assiniboine river at St. James, about four miles west of the city. In plan it is rather interesting, and I enclose a rough line drawing of same. The front of the living room opens by means of glass doors, the full width and height of room, so that in warm weather this room becomes practically a large verandah. The kitchen arrangement is most satisfactory as it is really quite detached from the remainder of the house and all heat and odor emanating therefrom is kept absolutely clear of the living rooms.

In taking up the larger work the banks call for the most attention. The completion of the Bank of British North America has been somewhat hampered on account of the delay experienced in waiting for stone and progress for this reason has been much slower than was anticipated. The work will, however, be ready for the roof towards the end of the month.

The contract for the Union Bank's eleven story steel frame building has been awarded to the Fuller Construction Company, of New York. It is needless to give a dissertation on the status

of a company which has reached such unprecedented records both in the amount of building continually under its supervision and in the remarkably short space of time in numerous instances required for the erection of same. The company is commonly known as the pioneers of steel frame buildings and their name is synonymous with "sky-scraper." The receiving of this contract has caused a new departure in the business of the Fuller Construction Company as it opens up a field in Canadian work which up to now had not been entered upon. Although the granting of the contract for such a large work would perhaps have been more satisfactory if it could have been given to a Canadian firm, yet in the present instance it can hardly be looked upon with disfavor. The methods employed by such a company, who are habitually used to command material and labor in any proportions, will be most interesting to follow in this western country where the supply of material of all description is chronically infinitesimal. To push a work of this category in Winnipeg with anything like the marvelous rapidity with which it is consummated in the States would from our present mode of building be nothing short of a miracle, and the entry of such builders amongst us cannot help but accelerate the movement of material in all quarters, and the benefit accruing from such cannot fail to eventually benefit the community at large.

The undertaking of a building of this description by the Union Bank cannot but be an incentive for other institutions of like calibre to follow and we may in the near future anticipate a series of like structures to be erected.

The building of the Carnegie Public Library is at last under way. The commission for this work was finally awarded to Mr. S. Hooper, architect. The original competition, open to all architects in Winnipeg, was after much turmoil and many stormy and unprofitable meetings, cancelled by the City Council on the grounds that the tenders on the first three selected designs were above the stipulated cost, and the remainder of the designs (five) not meritorious enough (presumably) in their opinion to warrant them considering same for tender. A second competition was subsequently held when Mr. S. Hooper and Mr. F. S. Griffiths were invited (the remaining original competitors ignored) to again submit plans in competition. Mr. S. Hooper was the successful competitor in the duel. Messrs. Smith & Sharpe are the contractors for the work and they expect to have the building closed in before the severe frost arrives.

Augustine Presbyterian church, Fort Rouge, Mr. J. H. Russell, architect, is well under way. The cost of the work is roughly about $40,000. The building will be faced with Tyndal stone throughout.

The Land Titles large new building on Broadway is progressing, but sufficient work has not yet loomed up to judge of anything relating to design.

The vote on the City By-law asking for an additional $60,000 for the addition to the Winnipeg General Hospital resulted in rather a peculiar manner. The total vote polled was somewhere about 2,000, and out of this number less than 100 voted against. As the law governing a poll of this nature stipulates that ⅔ of the total number of names on the voter's list must be cast the measure was at first thought to be lost on these grounds. The matter has, however, been taken up by the City, and legislation is now being sought whereby the poll can be legalized, as the vote showed that it was only through apathy on the part of the citizens that the by-law was not carried through. The passing of this measure by the Government is now practically settled and work is being proceeded with accordingly.

Nothing definite has yet been decided upon by the Canadian Pacific Railway regarding the projected new Subway, Station Hotel, etc., although work may commence here at any date.

W. PERCY OVER.

THE CANADIAN BUILDING AT THE ST. LOUIS EXPOSITION.

The contract for the erection of Canada's Pavilion has been awarded to John J. Dunnavant & Co., the contract price being $28,000. The building will be 100 feet square, two stories, and surrounded by porticos. The architect is L. Fewings Taylor, of Ottawa, Canada.

The building must be completed by December 1. A permit for its erection has been issued, and Mr. Dunnavant says he will commence work at once.

The Canadian reservation is about half way between the Agricultural Building and the Forestry, Fish and Game Building. The handsome pavilion which is to be Commissioner-General Hutchinson's official home on the World's Fair Grounds next year and which will serve as a club house for Canadian visitors to the Exposition, will stand southwest of and close to the big floral clock on the northern slope of Agricultural Hill. The building will face the avenue which runs north and south in front of the Administration Building and extends to the Agricultural Building.

The National Fire-Proofing Company, of New York, have published a leather bound Catalogue containing many useful tables giving safe loads and illustrating methods of fire-proof construction. The price of the book is $3.00.

Attention is called to the advertisement in this number of the Canadian Casualty & Boiler Insurance Company, whose head office is in Toronto. The managing director of this company, Mr. A. G. C. Dinnick, is a gentleman of ability and large business experience. He has associated with him men having the high standard of technical knowledge requisite for the proper inspection and insurance of boilers, &c.

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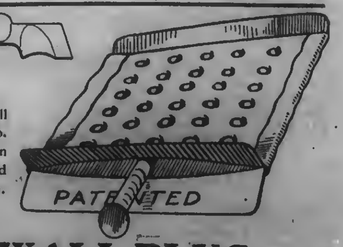

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Contributions of value to the persons in whose interest this journal is published are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

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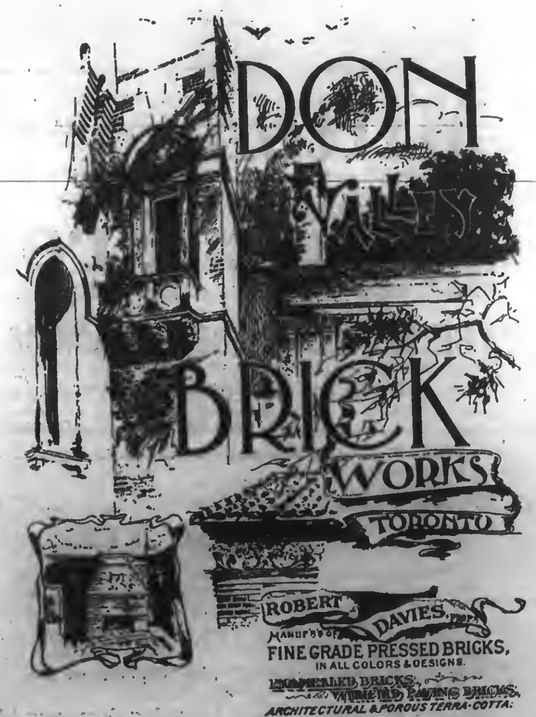
NOTES.

The price of bricks in Vancouver has recently been advanced by $2.00 per thousand, the price now being $11.00.

At the Dominion Fair and in fairs throughout the country the Dunlop exhibit of rubber mats, rubber tiling and rubber flooring, was a particularly interesting display for house owners and house builders. The company have introduced many new features both in designs and material. Their new catalogues are now out and are worth investigating.



A DEPARTURE IN HOT AIR HEATING.

Our readers will no doubt be interested in the paper printed in this issue by Dr. George M. Aylsworth, of Collingwood, describing a new method of heating, of which he is the inventor. In Dr. Aylsworth's system hot air is circulated through pipes and specially constructed radiators in the same manner as hot water is employed in hot water heating systems. The system is a distinct departure from the methods at present in use, and on that account alone is interesting. It remains to be seen whether in actual every day practice, it will fulfil the expectations of the inventor. In some rather severe tests which have already been made of the system by the inventor, it is said to have proved satisfactory. We would be pleased to publish the opinions of any of our readers with regard to this system.

WIRING METHODS AND MATERIAL.

We have previously had occasion to call attention to the crying need for improvement in the way in which electrical machinery and wiring is often installed, but the frequency with which cases of criminally careless work come to light, let alone those which at the best are but botchwork, would seem to indicate that the matter is in many cases being entirely lost sight of. As an example we would cite an installation which recently came under our notice in which a 2200 volt line was carried into the basement of a building, no lighter and no dryer than basements usually are, with ordinary weatherproof wire, run on knobs. At several points it had been necessary to insert connectors, parts of which extended to within two or three inches of each other and were not even taped over, notwithstanding that they were within easy reach of anybody passing, being but four or five feet from the floor. Further than this, ordinary lead composition fuse wire, bare, was in use. Compare the above with a proper equipment of rubber wire and enclosed fuses, the former run in conduit and the latter with their necessary connectors and mountings boxed in cabinets, and you will have some idea of its shortcomings. At another installation, a woollen mill, with its usual contents of highly inflammable material occupying all parts of the building, to say nothing of the lint and dust which invariably accompany such processes, there was found the old familiar open lead fuse, some in cutouts with porcelain covers and some without even this slight protection. This meant that the blowing of one of them was almost certain to ignite the pile of material immediately below it, with ultimate results which can easily be imagined. Proper enclosed fuses, installed in cabinets, would have cost but a trifle more and would have made a fire of electrical origin a remote possibility, instead of a large probability. Is it any wonder that when work such as found in the above instances is allowed to be put in, that the uninformed public, and for that matter, many who claim to be well posted, look askance at the proposal to introduce electric power. In the former of these cases the installation was a positive menace to life, and both offered every chance for a severe fire.

NOTES.

Under the direction of the Montreal Industrial Exhibition Association arrangements are being made to hold an important exhibition and fair in the city of Montreal in 1904.

An exhibit of Canadian building stone from the collection of the Geological Survey of Canada, was one of the interesting features of the recent Dominion Exhibition in Toronto.

The Allith Manufacturing Company have leased the building formerly occupied by Leitch & Turnbull at Hamilton, Ont., and will engage in the manufacture of track door hangers and other kinds of hardware.

With the aid of a ginpole, instead of derricks or travellers, for hoisting materials, Chas. T. Caldwell, of Columbus, Ind., is said to have made a record for rapid construction on the St. Louis Fair Grounds. Within fifty days he is said to have completed the Agricultural Building, 1800 feet long by 600 feet wide.

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BY THE WAY.

The theory that lightning never strikes twice in the same place has again been disproved. The new municipal buildings, Toronto, the tower of which was partially destroyed by lightning last year, was again struck last month. The damage was but slight, however, only one stone being displaced.

× × ×

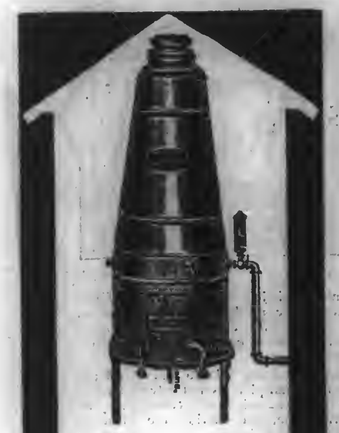
Notwithstanding loss of commissions as the result of building projects being blocked by recent strikes, some architects whose offices had for months been crowded with work, and who had consequently been compelled to work early and late were disposed to welcome the interruption as affording them opportunity for needed rest. However, a shorter period than three months would have sufficed for this purpose.

× × ×

Before the Court of Revision in Toronto the other day an appeal was made by the owners of two of the largest office buildings in the city for a reduction of assessment. One of the reasons urged in behalf of this appeal was that the revenue from these buildings netted the owners only two and one half per cent. on their investment. If this statement be accurate, it must tend to discourage investment in real estate of this character.

× × ×

Bow church, to the Rectory of which Mr. Hutton, the late librarian of the National Liberal Club, is being instituted, possesses what Darwinists would call a "survival," says the Westminster Gazette. This is the curious balcony beneath the clock, which represents the medieval tower from which the Court witnessed the tournaments in Cheapside. It was originally a wooden structure, which on one occasion collapsed, so that Queen Philippa and all her ladies "fell with great shame" on the heads of the assembled knights. Jerry building was discouraged in those brave days, and the careless carpenters were ordered to be executed. The royal balcony was last used by Queen Anne in the first year of her reign at a "pageant" devised by the "City Poet," Elkanah Settle.



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GOLF CLUB HOUSE, NEAR MONTREAL, QUE.
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SUMMER HOUSE AT ST. JAMES, NEAR WINNIPEG.

(For description see North-West letter in this Number.)

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SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
SEPTEMBER, 1906

The Canadian Architect and Builder

VOL. XVI.—No. 190. OCTOBER, 1903.

ILLUSTRATIONS ON SHEETS.

Business Premises, Yonge Street, Toronto.—Henry Simpson, Architect.
House at Fredericton, New Brunswick.
Font in English Cathedral, Fredericton, N. B.
House in Park Road, Toronto.—Burke & Horwood, Architects.
House in St. George Street, Toronto.--F. H. Herbert, Architect.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Lightbourne Court, London, from Road—Lutyens, Architect.
Electra House, London, Eng.—John Belcher, Architect.

ILLUSTRATIONS IN TEXT.

Drawings Accompanying Notes of Travel.
Brick Laying Machine:
New Canadian Emigration Offices, London, Eng.

CONTENTS

Editorial	159-160	Drawing and Architecture.—I	168
Notes of Travel	161-162	Architectural Practice, Real and Ideal	169
Effect of Variations in Water and Sand on Cement	163	Prizes for Engineers	170
Doors	164	Preservation of Steel Buildings	170
Production of Building Materials	165	New Canadian Emigration Offices	171
A Machine for Laying Bricks	165	The Building Trade and Mr. Chamberlain's Proposals	171
Mr. Percy E. Nobbs	165	The Colours of Stained Glass	171
By the Way	166	Legal	173
New Method of Chimney Construction	166	Standardizing of Bricks	174
Methods of Remedying Dampness and Efflorescence in Walls of Buildings	167	Notes	174-ix-x
		Column Foundations	ix

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" A. F. DUNLOP, R.C.A., Architect, Montreal.
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A Commendable Work

The Canadian Club of Toronto is performing a valuable public service by marking historic spots in the city and vicinity. During the last five years the Club has placed bronze tablets bearing suitable inscriptions on a number of ancient buildings and on new buildings erected on the site of ancient structures which were the scene of no able occurrences in the early history of the city and province.

Wages and Working Hours in the Building Trades.

An interesting table is published in the September number of the Canadian Labour Gazette, showing the changes that have taken place in working hours and wages of mechanics in the building trades in Canada during the present year. In ten towns and cities the wages of bricklayers and masons were increased by $1.00 to $3.00 per week; in fifteen towns and cities the wages of carpenters were increased from 25 cents to $3.00 per week. In Montreal, plasterers obtained an increase of $1.36 per week, and in Toronto $2.20. Wages of plasterers' laborers also advanced by $2.20 per week. Painters, decorators and paperhangers in eight cities got increases ranging from 65 cents per week in Montreal to $2.78 in St. Catharines. The wages of plumbers and gas fitters in six cities show advances ranging from 50 cents per week in St. Catharines to $5.33 in New Westminster, B. C. Stonecutters were given increases ranging from $1.50 to $4.00 per week, and builders' laborers of 28 cents to $2.10 per week. Coupled with this general rise in wages there were in many instances reductions in the number of working hours.

The Eiffel Tower

The municipal authorities of Paris have in view the purpose of transforming the Champ de Mars into a park. This means that the portion of the site of the Exhibition of 1900 lying south of the Seine, must be cleared, and that seven years hence, when the concession for the Eiffel tower will expire, that great and novel structure will disappear, and with it the most conspicuous modern landmark of Paris. For boldness of conception, and as an example of original and artistic design, the Eiffel Tower deserves to rank, as it has done since its erection, among the wonders of the world, and the necessity for its removal will be generally regretted.

Wall Papers

Attention is being called by the technical press of Great Britain to the fact that the export trade in wall papers to Germany from Great Britain is diminishing. A few years ago British manufactured wall papers were in large demand in Germany and a

profitable trade was built up. While it is claimed that the British manufacturers have neglected to put on the market new and attractive patterns, the Germans have greatly improved their manufacturing facilities, and are not only supplying to a considerable extent the home market, but are exporting largely to other countries. Their exports have, it is said, increased by 83 per cent. during the last five years.

Dismissal of an Architect.

Under the provisions of the Tarnsey Act leading architects in private practice have for several years received commissions from the United States government to design and superintend the erection of important public buildings. Such commissions must be won in a limited competition. In this manner Mr. Henry Ives Cobb was appointed architect of the new government building in Chicago. He was recently dismissed from the position with the concurrence of the supervising architect of the Treasury. The reason given for his removal is that he proved himself seriously lacking in business qualifications. The contracts in connection with the Chicago building are said to be in a muddle. This incident proves conclusively that the architect of to-day who aspires to surpervise the construction of important buildings must himself possess a thorough knowledge of business methods, or must have business men as associates. It is to be hoped that the dissatisfaction and trouble experienced by the United States government in this case, may not result in the repeal of the excellent law under which a stimulus is given to architecture profitable alike to architects and the nation.

The Housing Problem.

For many years in London, New York and other large cities the question of the best means of providing accommodation suited to the requirements and within the means of laborers, artizans and persons with small incomes has received much attention. The time has now arrived when this problem also demands consideration in the larger Canadian cities. In Toronto, where at present all classes of houses for rental are at a premium, families who are only able to pay a rental of from $10 to $18 per month, find it impossible to secure accommodation within this price limit. It is claimed that land values within the city coupled with the advanced cost of building and building restrictions will not permit of a fair return to owners of moderate cost houses, cousequently few are being built. So long as present conditions obtain there would seem to be but two feasible methods of meeting the demand for accommodation of this class. One is to erect flats in central locations within the city, which is the plan adopted in New York. The other is to build suitable detached or semi-detached houses beyond the city limits and provide means of rapid transit to and fro. From the standpoint of comfort, health and morals, the last mentioned plan seems to possess great advantages.

It can scarcely be hoped that the problem will be met either in one way or the other on strictly business lines. It must be undertaken in a large way and to some extent in a philanthropic spirit. In other words, those who put their money into the enterprise must be satisfied with a moderate return on their investment and find the balance of their reward in the assurance that they have helped to smooth the pathway and elevate the standard of living of their less favored fellow citizens. It is to be hoped that men of wealth may be found actuated by these motives, to give money, time and thought to the solution of this important problem of the present and future.

The Cement Industry.

The failure of the Consolidated Lake Superior Company's enterprises at Sault Ste. Marie last month resulted from the want of exercise of sound judgment by the promoters and managers. This failure is not only a serious blow to the shareholders, many of whom are Canadians, to the thousands of employes, and the business interests of the Sault, but also to the advancement of the whole province. It should teach the necessity for caution to the promoters of other industrial enterprises, including cement manufacturing concerns, of which we are in danger of having a surplus. The days of large profits in cement manufacturing seem to have gone by, and investors will do well to acquaint themselves with the conditions and discount the statements of glib-tongued promoters and stock peddlers, before parting with their money.

It is rumored that some recent enterprises in this line have been to a large extent stock jobbing schemes. The promoters are said to have received for their services large blocks of stock which they converted into cash as speedily as possible, leaving to the legitimate shareholders the responsibility of making the enterprises pay, which, in the case of over capitalized concerns is proving a by no means easy task.

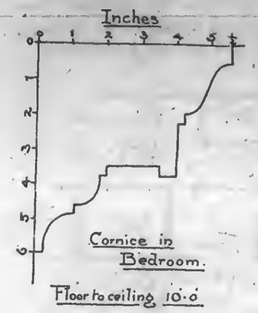
Some of the better class of technical journals in the United States are pointing to the experience of Germany as a warning against the investment of money in new cement manufacturing companies. Under the stimulus of a demand for cement for large public works manufac ories in that country rapidly increased until there were 261 of them, with a capacity of 29,000,000 barrels. Then the home demand dropped and the mills found themselves with a surplus stock of about 12,000,000 barrels.

The annual report of the Ontario Bureau of Mines lately to hand estimates the quantity of cement representing a year's consumption in the whole of Canada, at 1,100,000 barrels, and the possible consumption of 1903-4, taking into account the development of the country and the multiplying uses to which the material may be put, at 1,200,000 or 1,300,000 barrels. The yearly output of the factories as at present equipped, if all were working full time, is placed at 1,150,000 or 1,200,000 barrels, and when the improvements now in progress are made, it will rise to 1,700,000 barrels. The latter quantity is in excess of the present annual consumption, so that it appears to be within the capacity of the cement factories now in existence to supply the requirements of the home market. On the basis of these figures the report states that there are grounds for misgivings as to the future of the industry if all the cement works now being projected are built.

NOTES OF TRAVEL.—V.

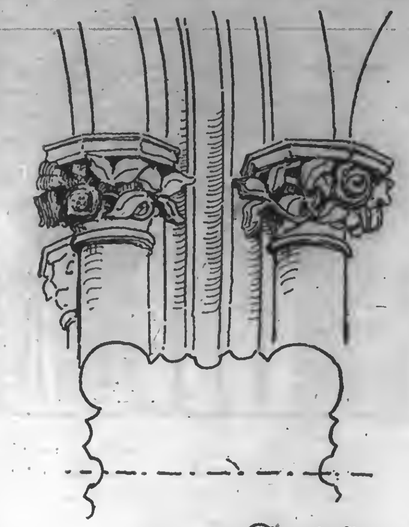
A flying journey on bicycles is not productive of careful drawing; but it was impossible not to make some notes, and they may be worth publishing.

Contemplating in a peaceful mood, on waking up in the morning, the bedroom cornice in my bedroom, in our inn, a Jacobean building, it seemed so thoroughly satisfactory that I thought a measured drawing of it would be worth something to readers of the Canadian Architect and Builder. The room had two windows on a long side. Over the windows, all vertical surfaces were dark, all horizontal surfaces white. Opposite to the windows this effect was reversed. On the short sides, which got a raking light, the whole cornice was blanched except the weathered soffit, which was a dark band. This variety was delightful. The breaking of the cornice around the chimney breast, at one end, was just right.



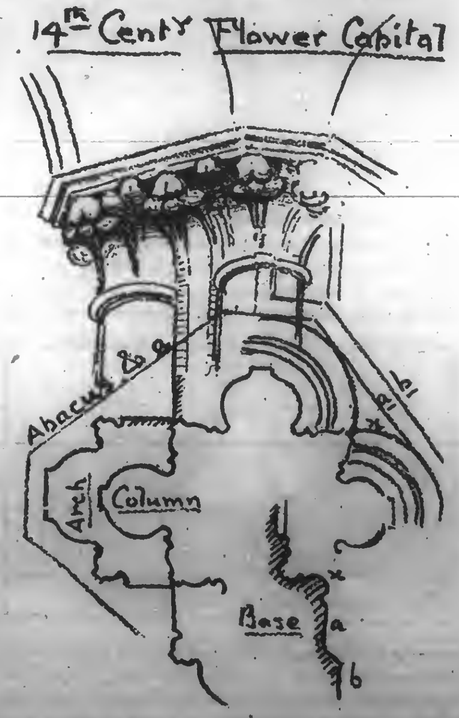
We visited a perfect Saxon church; but, in Canada, we have got ahead of the Saxons. The parish church, on the other hand, if one could bring it over, would be the finest church in most towns and the most interesting in the country. What, however, seemed best worth noting, because differing from other work of the kind, was a restored portion, in which the architect had, with success I thought, ventured to be original. Two columns had scrolls as shown above; said to have been a whim of the lady who paid for the restoration. The ribbon ends require judicious abstraction. (They were, in this case, given the comparative obscurity of the aisles). The bands were not in the least simulative of ribbons but good solid masses, 8 inches deep, with a minimum projection of 2 inches beyond the surface of the angle shafts, which meant at least 4 inches out from the deepest hollow of the mouldings. The surface of the bands waved slightly, not to follow the line of the mouldings, but arbitrarily, for the sake of a varied surface. The jointing was a difficulty; it had to be jogged to avoid a feather edge, and was made as inconspicuous as possible.

The capitals of the restored part were also interesting; as being original, yet in perfect keeping with the style, carefully modelled roses, yet abstract enough for stone. The 14th century could do this sort of thing as well, or better, when it chose. A couple of days afterwards, among some beautiful "stiff leaf foliage" capitals (which were, however, not so stiff as they appear in the books but, on this occasion at any rate, full of life and gracefulness) the above flower forms appeared. The sort of clinging springingness with which they grow under the projection of the cap was well expressed.



Rose Capitals

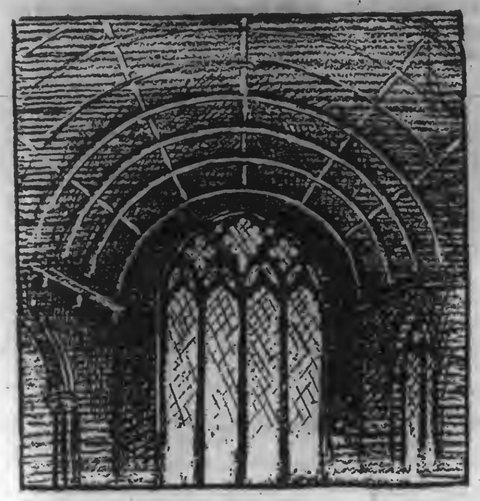
It is impossible not to become deeply interested in these beautiful white stone churches, but interest is qualified by doubt as to its immediate utility. The



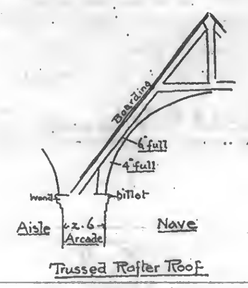
roof, however, which is commonly met with in village churches suggests application. It is a form which goes very well with a medium pointed window, and has a

NOTE.—We regret that the illustrations to the Notes of Travel in the September number were published without acknowledgment that they were the work of Mr. E. H. New, reproduced from a pamphlet printed by the Guild of Handicraft in connection with an exhibition of their work.

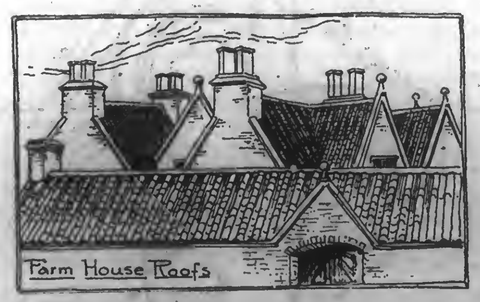
continuity of form that is as dignified as vaulting and, if anything, richer; quite apart from the barn-like effect of principals and purlins. It is unfortunate that



age cannot be made a condition of contract; unfinished oak, bleached like bones with age, goes admirably with stone and inspires respect from its venerableness. But I have seen a beautiful new roof of the kind by Mr. Bodley. It takes a thickish wall, if the curved member

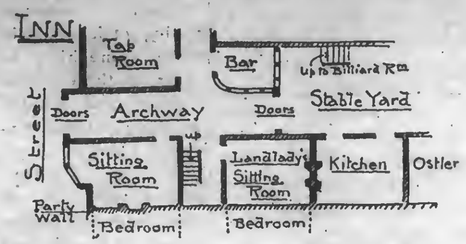


is to be flush with the wall, as it ought to be. The roof in the above section spanned about 25 feet and was a degree or so steeper in pitch than 45 degrees. There was a narrower aisle roof on each side (the window was at the end of one). This of course means



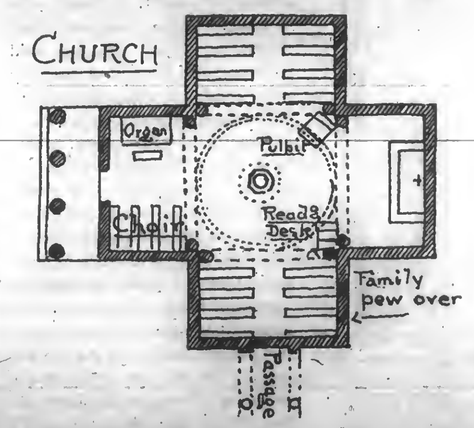
a couple of horizontal valleys of the full length of the church; but that is one of the privileges of this frostless country. It simplifies the roofing question and, as a consequence, complicates the roofs. There is no use in our imitating this kind of thing in Canada; though we cannot pass it in England without stopping to admire.

The mildness of the climate is still further exemplified by the plan of our inn, every room is practically out of doors; for the doors of the archway are never closed except at night; and, while they are open, even the upstairs rooms may be said to be out of doors; for the staircase opens off the archway, and there are no hall doors above. It is a case of dwelling in tents. In winter it



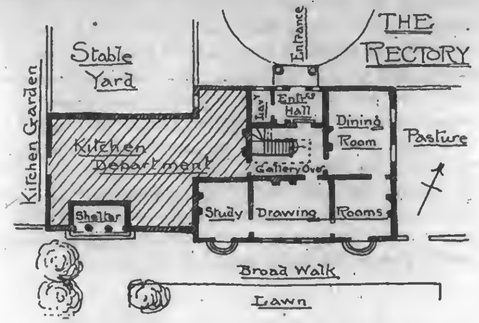
must be like a series of warm air baths, with cold plunges between: that is, if the rooms are warm.

On Sunday we went to a little Doric church connected by a passage with the hall. The church was a solemn little composition, but not big enough or comfortable enough to be really dignified. The crossing, under a dome, was about 25 feet square; handsomely paved in marble, and vacant; except for a little, lonely font in the centre. The crossing was probably a cube, and was domed with a semi-circle on top of semi-circular arches. The arms of the cross extended a little more than half their width and were barrel roofed. It was interesting to see how well this building was lighted by a small lantern in the dome and semilune windows at the ends of the arms. The glass was also coloured, though not



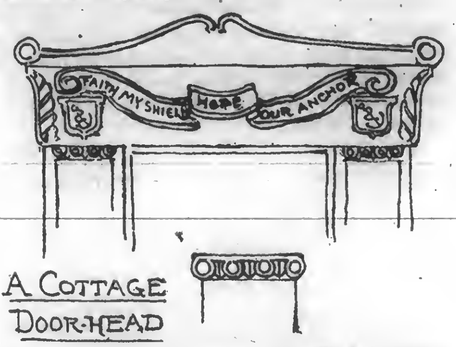
deeply. We dined at the Rectory, which had a good set of rooms looking southwards. The most interesting feature of the plan was a galleried hall which was roofed above the rest of the (two storied) house and lighted by circular windows in a clear story. There was a fine and well lighted wall space, above the gallery, for hanging large pictures. The land to the south of the house was the rectory glebe and let out for hay and pasture, excepting a lawn and gardens attached to the house. The gardens were enclosed by a stone wall, sinuous in plan for the sake of greater stability. It

was open to the suspicion of looking more knowing than it was. It looked as if buttresses would be better in every way. It was interesting to meet here a ha ha fence. The pasture, on the east, was enclosed by a stone wall; but, instead of running past the south front of the house, to enclose the lawn, this wall, when it came to the east line of the house, dipped underground and became the retaining wall of a wide ditch. As the ditch was invisible from the drawing room windows, the effect was of an unbroken slope of grass, stretching



away in boundless continuity to the rising and wooded ground of the park.

The hall, which we saw in the afternoon, is of the Italian period and dull; but size and stone are always something, and a stone flagged terrace, about 30 feet wide and 90 feet long, handsomely balustraded, with the valley of the park seen beyond, stretching away in a perspective of heavily wooded slopes, is a vision to remember as long as possible.



W. A. LANGTON.

A BUILDING COMBINE.

To the Editor of the CANADIAN ARCHITECT AND BUILDER:

SIR,—I have learned from a reliable source that some fifteen Toronto contractors who were asked to submit tenders for the construction of a new grand stand at the Woodbine race course, after laying their heads together, agreed on a uniform basis for tendering. It was further agreed that whichever one of their number might receive the contract must give the sum of one hundred dollars to each of the unsuccessful tenderers.

It is a well-known fact that there has existed for some time in Toronto a combination among heating contractors, the fact being clearly enough apparent from the character of the tenders.

Some architects have already brought in outside contractors to do their work, and express their purpose of following the practice to a much larger extent if such illegitimate methods of getting fancy prices are persisted in by local contractors.

I think it only right that this sort of thing should be exposed even at the risk of frightening persons out of the idea of building.

FAIR PLAY.

EFFECT OF VARIATIONS IN WATER AND SAND ON CEMENT.

TENSILE STRENGTH OF CEMENT MORTAR WITH SAND GRAINS OF DIFFERENT DIAMETERS. RESULTS GIVEN ARE THE AVERAGE OF 6 BRIQUETTES.

Sand gauged. Per cent. passed No.	Retained on No.	Natural cement mixed with Water, Per cent.	Portland mortar, 2 to 1. Water, Per cent.	Hoffman. Water, Per cent.	Portland mortar. 2 to 1. Giant. 28 days	6 mos.
100	Flue	17	10½	6½	25⅝	351
	20	17	10½	6½	25⅝	351
	30	17	10½	6½	25⅝	351
	50	17	10½	6½	25⅝	351
	100	17	10½	6½	25⅝	351
100	20	17	10½	6½	25⅝	351
	30	17	10½	6½	25⅝	351
	50	17	10½	6½	25⅝	351
	100	17	10½	6½	25⅝	351
50	20	17	10½	6½	25⅝	351
	30	17	10½	6½	25⅝	351
	50	17	10½	6½	25⅝	351
	100	17	10½	6½	25⅝	351
25	20	17	10½	6½	25⅝	351
	30	17	10½	6½	25⅝	351
	50	17	10½	6½	25⅝	351
	100	17	10½	6½	25⅝	351
Crushed quartz	20	17	10½	6½	25⅝	351
	30	17	10½	6½	25⅝	351
	50	17	10½	6½	25⅝	351
	100	17	10½	6½	25⅝	351

Sand gauged. Per cent. passed No.	Retained on No.	Natural cement mixed with Water, Per cent.	Portland mortar, 2 to 1. Water, Per cent.	Hoffman. Water, Per cent.	Giant. 28 days	6 mos.
100	30	17	10½	6½	25⅝	351
	50	17	10½	6½	25⅝	351
	100	17	10½	6½	25⅝	351
50	30	17	10½	6½	25⅝	351
	50	17	10½	6½	25⅝	351
	100	17	10½	6½	25⅝	351
25	30	17	10½	6½	25⅝	351
	50	17	10½	6½	25⅝	351
	100	17	10½	6½	25⅝	351
Crushed quartz	30	17	10½	6½	25⅝	351
	50	17	10½	6½	25⅝	351
	100	17	10½	6½	25⅝	351

MEMO.—All proportions and percentages determined by weight. Natural sand used; first passed through No. 20 screen and caught on No. 30 screen and residue screened and caught on No. 50 screen; then passed No. 20 screen and caught on No. 30 screen and residue screened and caught on No. 50 screen; then passed No. 30 screen and caught on No. 50 screen; then passed No. 50 screen and caught on No. 100 screen. "Flue" is clean white sand sifted through the No. 100 screen.

Tensile Strength of Cements Mixed Neat With Different Proportions of Water.

Water. Per cent.	Wire minutes. Light.	Wire minutes. Heavy.	Tensile Strength. 24 Hour.	7 Dsys.	28 Dsys.	3 Mos.	6 Mos.	12 Mos.
			Giant Portland.					
15	12	207	371	655	875	941	720	787
16	29	297	303	750	973	1,008	735	816
18	80	855	260	649	773	931	645	748
20	142	402	233	500	693	716	621	676
22	268	473	184	546	635	658	601	589
24	327	912	107	539	640	644	629	755
			Atlas Portland.					
13	13	270	366	775	859	1,067	892	832
14	18	303	404	780	801	972	852	781
16	22	327	363	602	725	844	806	723
18	15	383	308	570	723	785	728	724
20	56	703	225	590	718	760	674	636
22	52	833	166	554	649	731	643	604
24	188	918	42	510	691	695	632	574
			Union Portland.					
23	18	32	212	251	252	311	275	356
25	18	30	185	218	215	289	300	341
27	21	42	150	188	220	257	272	314
29	20	52	128	178	202	246	248	256
31	21	57	112	173	199	224	250	309
33	27	85	104	172	182	267	246	290
35	38	137	93	121	178	260	286	319
37	34	160	85	108	168	262	306	320
39	67	233	85	119	202	252	371	400
			Hoffman Rosendale.					
23	22	59	138	177	271	332	284	264
24	..	78	125	141	264	342	309	310
25	35	120	150	164	216	308	318	321
27	49	143	117	116	194	305	345	272
29	76	166	96	105	164	272	320	267
31	117	212	72	72	159	270	371	225
33	115	235	62	71	147	277	379	244
35	127	400	50	64	112	245	318	315
37	198	828	59	62	06	...	284	351
39	260	1,057	54	56	85	...	355	304

NOTE.—Results tabulated are the averages of six briquettes. The residue left on sieves of 50, 100 and 180 mesh were: Giant, 0.15, 5.4 and 21.2 per cent. respectively; Atlas, 0.1, 7.0 and 18.0; Union, 0.1, 4.6 and 10.2; Hoffman, 2.3, 12.4 and 21.9.

A heating boiler for steam and hot water, designed to burn coke, has recently been placed on the United States market by the American Radiator Co. The McEachren Heating and Ventilating Co. of Galt, Ont., have been manufacturing a boiler in which during the coal famine last winter, coke was successfully burned.

DOORS.

For the last few weeks we have directed our attention to the study of doors, pursuing a line of thought that we believed to be original. Imagine our chagrin when on reading one of the "Sketches by Boz," we found this pet idea or theory of ours had been made public years ago; but the dissappointment we experienced was considerably lessened when we reflected that Dickens himself had viewed in the same light the desirability of the design of the door portraying the character of the occupant. He states: "We are very fond of speculating, as we walk through a street, on the character and pursuits of the people who inhabit it; and nothing so materially assists us in these speculations, as the appearance of house doors. The various expressions of the human countenance afford a beautiful and interesting study; but there is something in the physiognomy of street doors almost as characteristic, and nearly as infallible. Whenever we visit a man for the first time we contemplate the features of his door with the greatest curiosity, for we well know that between the man and his door there will inevitably be a greater or less degree of resemblance and sympathy."

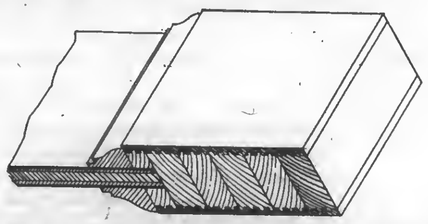
In designing the street door, did we ever for a moment study the individuality of the occupant? For instance, a five panelled, flush planted moulding, two feet ten by six feet ten door, would be most suitable for little spare priggish men, who are perfectly satisfied with their own opinions, and what can better bespeak the man of substance and genial hospitality, than a door three feet six wide, with raised panels and bolection moulded. Then there is the door solid below, with glass in the upper half. This is suitable to an innumerable class of people; the pretentious and vulgar divide the light into elaborate geometrical patterns, and glaze it with bevelled plate. Sometimes it is glazed with one clear light of glass— a standing invitation to all passers by to look with envy at the gorgeously furnished interior, and very occasionally we find it daintily screened with lace curtains, by the modest and retiring housewife, who timorously shrinks from the vulgar public gaze.

The types of street doors are innumerable and have a far reaching influence. If you ever find your client dissatisfied, or a man changing his habitation without any reasonable pretext, depend upon it, that although he may not be aware of the fact himself, it is because he and his street door are at variance; he is induced to move and seek a house with a street door more congenial to his foibles.

In studying this question of doors, we have come to the conclusion, that both the size and design of the door is more fixed than any other feature in an ordinary sized house. Let us take a so-called modern house; the drawing-room is designed in a style we will call Louis Quatorze, the library is Elizabethan, and the dining-room has a Dutch feeling throughout, and the hall, well we will make this Colonial, for it is necessary, if we wish our house to have all the modern improvements, that we treat each room in a different style. It is not a question of size or shape, or adaptability of the room, we must cram into it any style that is fashionable, if we wish to have a modern house with the latest improvements. Rosengarten has much to answer for in this particular, with his six hundred and thirty nine illustrations of various styles.

Let us now consider the doors opening off the hall into the various rooms. The framing of the door must necesarily show the same on both sides, and therefore, the design is more or less fixed. We must depend largely upon the treatment of the architrave around the doors, to give it the character peculiar to the style.

Another point to consider is the kind of wood in which the various rooms are finished, but this problem is more readily solved than the previous one, for in these days of perfected machinery, the door can be veneered with any kind of wood. We have lately seen a very ingenious method of applying the veneer by Messrs. Gilmour & Co., Trenton, Ont. The core as in the veneered door is built up in three or four pieces, but both the core and the veneer are grooved and fit tightly into each other, thus, apparently giving three times the glueing surface there is in an ordinary flat veneer; the panels are built up of five ply stuff with the grain running in different directions.



Some two or three years ago we were discussing this question of veneered doors with a builder from England, and it was with the greatest difficulty we got him to admit that a built up veneered door under certain conditions, was superior to a solid door. Even when he was finally convinced, he wound up by saying it was a sham.

Obviously, however, it is no more a sham than a stone front with brick backing. There is no country in the world, where the climate is so varied as in this Canada of ours, and we know that solid doors do not always withstand the extremes of dryness and humidity. The dry steam heat in our buildings during the winter months, and the humidity of the summer and fall, frequently cause solid doors to shrink and check, whilst the advantage claimed for a veneered door is that these varied climatic changes have little or no effect upon it. As to its being a sham, we would remind our English friend of Emerson's statement: "It is a rule of largest application, that in the construction of any fabric or organism, any real increase in fitness to its end is an increase of beauty."

It is reported to be the intention of American Plate Glass manufacturers to make a heavy reduction in prices with the object of crippling their foreign competitors. The announcement is said to have caused consternation among the Belgian glass manufacterers who have hitherto done a large export trade with the United States.

In Dawson City water for domestic purposes is said to be supplied through machines operated by dropping a coin-shaped slug into a slot, in order to avoid the difficulty arising from freezing of house service pipes in that cold region. Five gallons are delivered at a time. There are few if any house service pipes.—Engineering Record.

PRODUCTION OF BUILDING MATERIAL.

From the annual report of the Ontario Bureau of Mines for 1901, it is learned that the output of building and construction materials has for some years been steadily increasing, and the aggregate for 1902 was in excess of that of 1901, though in one item, that of common brick, there appears to have been a falling off, presumed to be due to the average price having advanced from $5.90 to $6.41 per thousand.

The following table gives the statistics of the production of building stone, rubble, etc., lime, common brick, and pressed brick and terra cotta for the five years 1898 to 1902:

Material.	1898.	1899.	1900.	1901.	1902.
	$	$	$	$	$
Building stone, rubble, etc	750,000	667,512	650,342	850 000	1,020,000
Lime	308,000	535,000	544,000	550,000	617,000
Common brick	914,000	1,313,750	1,379,590	1,530,460	1,411,000
Pressed brick and terra cotta	100,344	105,000	114,419	104,394	144,371
Totals	2,072,344	2,621,282	2,688,351	3,034,854	3,192,371

Other clay products consisting of drain tile, paving brick, sewer pipe and pottery, were made during the year to the value of $604,280, a slight decrease from 1901.

A MACHINE FOR LAYING BRICKS.

An Englishman, John H. Knight, has designed a machine for plain brick laying, shown in the illustration. Vertical posts are set in the ground about 15 ft. apart. Adjacent to the wall to be built to these posts is secured a wooden girder upon which is screwed a 6 in. x ¼ in. steel plate. This steel plate forms a bed on which the machine runs. The driving mechanism consists of a toothed pinion meshing with a pitched chain along the girder, motion being given to the pinion by gears and handle. A guide bar secured to the girder forms the straight-edge for the face of the bricks which are fed to the machine by hand. A pawl operated by a separate handle serves to press one brick back against the

Brick Laying Machine.

previous brick. Each brick as it moves back pushes a ridge of mortar in front of it, so that the vertical joint between the two bricks is filled. The mechanical bricklayer pats the top of each brick, this being done by a spiked roller which derives its downward pressure from a stout spiral spring regulated by the adjusting screws. The mortar is run out by hand in front of the machine. As each course of bricks has been laid the girder is lifted by hand 3 in. Holes are bored in the upright posts to form catches for a lifting lever. Two men and a boy can operate the machine. One man spreads the mortar, the second feeds the machine and the third operates it. Mr. Knight claims that the machine will lay down from 500 to 600 brick an hour.

MR. PERCY E. NOBBS.

We are privileged to present to our readers the accompanying portrait of Mr. Percy E. Nobbs, who recently entered upon his duties as Professor of Architecture at McGill University, Montreal, in succession to Prof. S. H. Capper.

Mr. Percy E. Nobbs.

Mr. Nobbs is a native of Haddington, N.B. His earlier years were spent in Russia, where he received his first artistic instruction at the School of Design, St. Petersburg. In 1887, he entered the Edinburgh Collegiate School, leaving in 1893 to take the Arts Course (new regulations) at Edinburgh University. During his school and college years he took various art and technical classes at the Heriot Watt College, the school of art and the new school of applied art, all bearing on his profession.

In the spring of 1896, Mr. Nobbs graduated as M. A., and travelled abroad before becoming an articled pupil with Mr. R. S. Lorimer, A.R.S.A., of Edinburgh, with whom he remained four years. In 1900, he won the Tite C. Prize at the R.I.B.A., and passed his examination for A.R.I.B.A., afterwards spending a further period in foreign travel and study.

In 1901 he entered the service of the London County Coucil, where he gained much practical experience of building operations. Subsequeutly he became chief assistant to Mr. A. Hessell Tiltman, F.R.I.B.A.

In January of the present year Mr. Nobbs was awarded the Owen Jones Travelling Studentship (£100) for a scheme for the decoration of a church in mosiac.

He is a member of the standing Committee on Art of the R.I.B.A., and the author of a number of valuable papers on professional subjects presented before the Edinburgh Architectural Society.

In assuming the chair of architecture at McGill, Mr. Nobbs will endeavor to give practical form to ideas already clearly defined, and which it is hoped may improve the status of architecture and of architectural workers in Canada.

BY THE WAY.

The memory of prominent events and persons who have figured couspicuously in national affairs, is being perpetuated by the designations given to streets in London. Some of the newer thoroughfare bear such names as Pretoria, Joubert, Hawarden grove, etc.

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I observe that Lieut. Peary, of the United States Navy has been granted three years leave of absence to enable him to make another attempt to reach the North Pole. If Mr. Peary does not achieve greater things on this than on his last two or three expeditions, our own Captain Bernier stands a good chance of getting to the pole first.

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We find a good many faddists among architects, but if reports be true they are eclipsed by a certain Swiss silk manufacturer, who has had built for himself a counterpart of the Swiss lake dwellings exhibited in the Zurich Museum. This architectural freak is built on piles in Lake Constance a distance of 200 feet from the shore. Around the house is a gallery 5 or 6 feet wide. The exterior of the walls is covered with osiers and lime. The floor is of plaster and the roof is thatched. Instead of glass, bladder is used. Wood of the yew has been employed as far as possible.

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I learn from "Indian Engineering" that the director of railway construction of the Public Works Department of India has issued a circular to engineers employed on large works asking them to experiment with the process which is said to have been recently discovered in the United States for increasing the tenacity of clay by mixing it with a liquid obtained from boiled straw. Mention of this discovery was made in a recent number of this paper. It is said that this process was employed by the ancient Egyptians in the manufacture of bricks, and that by this means the strength of bricks can be materially increased.

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They have a quaint way of telling the time of day in the Roothings, according to an Essex contemporary. A working man who was walking from Ongar towards Dunmow passed through a village about mid-day, and, wishing to know the hour, asked an old dame who stood at her cottage door if she could tell him the time. "Yes, that I can, boy, if you wait a minute," she exclaimed. She at once hobbled to the end of the row of tenements, and glancing up at a tall cottage chimney, athwart which the rays of the sun fell, said, "It wants just a brick and a-half to one." The surprised traveller, though a bricklayer by trade, had no knowledge of brick chronology, and enquired how many bricks went to the hour. The old lady explained that there were three bricks to the hour; and thus the time would be 12.30 p.m. The mystified man made off to the nearest wayside tavern for his mid-day meal, and he found that the cottage's sun-dial was true, for the hands of the inn clock pointed to half-past twelve.— British Clayworker.

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Up among the arches of the great new cathedral at Westminster a "twittering" may be heard which, on investigation says the Builders' Record, is found to proceed from a score of young ladies enveloped in overalls. These are the workers on Mr. George Bridge's mosaics —in the chapels of All Souls and of St. Gregory and St. Augustine on either side of the vast nave. Mr. Bridge finds that the young ladies suit his needs admirably, but it must not be supposed that they are there without training. "I have ladies come to me sometimes," say Mr. Bridge, "who think they can set to work at once and earn two or three pounds a week. But that is, of course, absurd. There is a great deal of technique to be mastered, and I estimate that a fairly clever worker needs two years' experience before being put on figure work"—these young ladies have been through the schools and drawn from the "life," so that they are able to handle the mosaic in an intelligent manner. Mr. Bridge's first pupil was his wife, who succeeded so well that he decided to engage other female workers; until we find him here in the cathedral directing quite a school of them. The practice of architecture as a profession for women receives periodical attention but, with a few exceptions, never becomes a reality. For ourselves we do not think it ever will while contractors are men, not always gifted with the tongues of angels; but there is surely a field for women in some of the applied arts connected with architecture where, indeed, the subtler touch of the female hand and the more delicate gauge of the female eye may prove a boon—a possibility to which Mr. Bridge's practical experience gives much hope.

NEW METHOD OF CHIMNEY CONSTRUCTION.

As a substitute for the special device called "wagons" usually employed in the construction of chimney flues in Paris, M. Morel suggests the use of a special form of brick which while strictly conforming to the Police Regulations admits of easy and quick construction and close union of the various parts of the flue. The British Clayworker describes the method thus: The sides are perpendicular to the horizontal surfaces, except one side, which is at an angle of 30 deg. to make a joint between two flues. To enable crossing of the other straight joints one part of the brick is longer than the other part. The bricks are laid as follows: A brick being in place, a second is turned in such a way that the two surfaces are applied one against the other, forming a joint with mortar. Thus a first course is laid, and, as the joints have to be crossed, the bricks in the second course are laid on the two bricks mentioned, and turned so that the large sides of the bricks in the second course are applied against the small sides of the bricks in the first. The inclined joints of the second course are thus in an opposite direction to those of the first. When the flues bend, the bricks are usually laid on different surfaces in steps, forming places where the soot can accumulate to be removed when the chimney is swept. To avoid this inconvenience the flues must be made of plaster or cement. M. Morel employs a special brick with inclined surfaces, which can be utilised with ordinary bricks. A course of bricks is laid and between two courses of these bricks the new bricks are laid, which have two oblique sides. Thus a flue is obtained not having an arrangement in steps, but a sinuous surface, requiring no facing, from which soot can be easily removed.

A new building by-law recently adopted by the city of Minneapolis compels fireproof construction of all public and quasi-public buildings of over three-storey dimension, and prohibits the use of cinder concrete.

METHODS OF REMEDYING DAMPNESS AND EFFLORESCENCE IN WALLS OF BUILDINGS.

The following on the above subject is extracted from a work by Adolph Wilhelm Keim, German Chemist:—

Most of the methods which have been proposed for curing damp walls have been based on the use of waterproof plastering or paint, or depend on the principle of employing hollow walls, with or without ventilating apertures. The former device may in certain cases fulfil the desired end, although as a rule it merely hides the mischief for a time and actually aggravates it. The plan of using hollow walls with ventilating channels, whilst more correct in principle, is both costly and difficult of application to old houses.

Vaudoyer has the following remarks on these two methods: Imagine the wall of a basement to be affected by moisture, and to exhibit efflorescences on its external surfaces; it would be of no use to try to shut the damp into the wall, we must rather afford it an opportunity of being dried by the air, whilst endeavouring to remove the cause. With this object air channels should be inserted in the walls above the ground level, cellars may be excavated where none already exist, the inner and outer plastering of the walls may be removed, and any precautions similar to those which are employed in new construction may be adopted. In cases however, in which these precautions are no longer possible or when in spite of them the effects of dampness still continue to exhibit themselves, recourse must be had to other means, such as the following: To prevent the moisture which is present in the wall of a building, and shows itself on the interior surface, from influencing the air of the apartments, the best plan is to face the wall with hard tiles, set on edge at a distance of about an inch from the face of the wall so as to permit a circulation of air between the wall and the inner casing. It is beneficial to give the inner surface of tiles a coat of asphalt, especially those which are tied to the wall, whilst the outer surface may be coated with plaster(?), which when perfectly dry can be painted or plastered, or, since wall-paper does not adhere well to plaster of Paris, it may be pasted upon coarse linen.

This system would afford all needful security, and further harm would arise from the moisture even if it still remained in the wall which was originally affected by it; but even in the wall itself it would be markedly diminished by the ventilation which would be established between the wall and the inner casing. A less expensive expedient would be to erect wooden battens against the wall, with diagonal ties, to nail laths upon these, and then plaster the laths. This would give a thin partition, isolated from the wall. The wooden battens, being in contact with the damp wall, would have no great permanence; they should at least be well tarred, and have sheet-lead interposed between them and the wall; a free circulation of air is, moreover, absolutely necessary. Wooden wainscoting amounts in fact to an isolated partition, and it is certain that the partial, or, if necessary, the complete lining of the walls of a room with wood is a great protection against damp; nevertheless, the ill effects of moisture on the building itself will still have to be feared if a free circulation of air is not provided for behind the wainscot, the back surface of which, moreover, should be well tarred.

Although the system which has just been described is to be preferred to any other, it nevertheless has the disadvantage of reducing the size of the apartment considerably; we have therefore to consider whether other devices may not in some cases be adopted.

In cases where the wall in question is an interior wall separating two apartments, both of which require to be screened from damp, there is no alternative but to adopt the system of isolated partitions; for if any coating impervious to moisture were applied immediately to the wall, the result would simply be to enclose the damp in the substance of the walls, and would promote a destructive action which would be all the more detrimental because it would escape observation. But where the damp shows itself in only one of the rooms, it would seem that to suppress it on that side of the wall would drive it to the opposite one, where, however, it would not be so harmful as in the former case, because at that side the air might be relied on to evaporate it to a large extent. In such a case it is better to avoid the use of an isolated partition, and to apply directly to one side of the wall the waterproof coating which is regarded as the best protective. It must, however, be admitted that few of these will long maintain their coherence with a wall which is perpetually damp. Framed partitions take such a coating more readily than walls built of stone. The material selected for application should, if possible, be one that will penetrate into the substance of the wall. Such an application may also be employed for the inner surface of an exterior wall, if this has a favorable aspect. For if one of the surfaces is exposed to the influence of the air, the damp will be able to escape from the whole thickness of the wall.

Although this plan presents indisputable advantages in some cases, there are others in which the wall may be coated with glazed tiles, affixed with good mortar; or, in rooms where a tiled wall is not appropriate, the rough side may be left exposed, and can then be covered with paint and any desired style of ornamentation. In some instances, tiles saturated with asphalt may be used; in others the whole surface may be covered with thin sheets of lead. The chief difficulty in using metallic plates is to find a suitable material for attaching them to the wall. This is required not only to harden readily, but also to adhere firmly to both the surfaces to which it is applied.

It would be superfluous to remark that a damp wall to which cement, or any other waterproof material, is to be applied, should first be stripped of its former coating, and allowed to dry for some time before the new coat is laid on. And it must further be remarked that rendering with mortar consisting of hydraulic lime and sand gives a surface which is quite unsuited to receive a coat of oil paint, since the latter would not adhere well, but would speedily peel off.

C. G. Demich has proposed some extremely complicated ventilation attachments, which are so costly that scarcely any one would introduce them into old buildings, on which account I pass them over. But he also gives the following method for protecting against damp:—

An excellent method (he says) of preventing the escape of water vapour from damp walls is to cover them with small glazed clay tablets. These tablets, which can be made by any potter, are about ⅞ inch square and ⅜ inch thick, and are glazed on one side. They are attached to the wall, with the glazed side outwards, by good mortar or plaster and small clamps. A wall covered with such tablets has not an unpleasant appearance, but when lighted up at night, the glitter is injurious to the eyes. To avoid this the tablets may be fixed with the glazed side towards the wall, the rough side coated with a thin layer of fine cement, floated, and papered. When the damp is not excessive, the wall may be covered in the same way with old window glass, then floated with cement, and papered.

DRAWING AND ARCHITECTURE. —I.

By Prof. Percy E. Nobbs.

Note By The Author :—These three short papers on (1) Drawing and Architecture ; (2) The Styles of Architecture ; (3) Material and Design ; are intended as an introduction to the study of Architecture for students assumed to possess no knowledge of the subject, and the themes are treated with regard to their bearing on study only. They were delivered at McGill University this September.

As a beginning to our first winter's course in Architecture, we shall devote three lecture hours to the consideration of what may be called the first principles, not of Architecture, but of Architectural Studentship, before taking up our studies in Construction, Theory and History. It is not likely that my students will at once fully understand all these principles imply, for it is very difficult properly to express any ideas connected with our art in words,—written or spoken.

In the "Elements of Drawing," Ruskin says to his reader :—"If you wish to learn drawing, that you may be able to set down clearly and usefully, records of such things as cannot be described in words, either to assist your own memory of them, or to convey distinct ideas of them to other people, * * * then I can help you, or which is better, show you how to help yourself."

Now it is with "such things as cannot be described in words," that we have to deal,—after all a specification gives a very poor idea of a building, even to the expert. But happily we have in drawing, a way of expressing architectural ideas and a way capable moreover of the utmost refinement of expression.

To-day we shall make a short enquiry into the relations which subsist between the art of drawing and the art of building.

The modern architect must draw, and draw well. We shall have no difficulty in coming to that conclusion. Before going further, however, I would impress it upon you as students, (and this will be the burden of my song, till such time as I have done with you,) that we must never regard drawing as an art worth cultivating for its own sake. Let us take all the pleasure we can in drawing well, and the more pleasure we find in it the better we shall draw ; but we must never forget, that it is the rightness of the subject matter alone that is of any importance to the architect. True, a neat clean drawing is more pleasant to handle and peruse, than a dirty or careless one ; but it is only so far as the facts on the paper are unimpeachably true, are easily understood, and have reason in them that the drawing is worth anything. The very great majority of students' drawings are worth less than half the value of the paper they are on, because both sides have probably lost their original whiteness by the time the drawing is finished. When we have come to regard our drawings in this light,—as damaged paper in no way beautiful, certainly not decorative, but, possibly a little useful,— then the first step has been reached on the stair which leads to the halls of architectural learning, and not until then.

Truth in a drawing is the only thing worth paying for, and he is paid best who puts most truth, with given labor, on a given area of paper. Speed in drawing is the only thing that makes it possible to earn a living as a draughtsman, and we may here remember with profit, that on leaving McGill we have several years to live as draughtsmen, before we can design so simple a thing as a rabbit hutch in the really, best possible way. Success in this profession, on which we have embarked, possibly with a very light heart, depends to a great extent on our drawing ; for unless by this means we can be of real use to an architect on leaving college, our progress will be slow, and practical experience will come in a meagre measure, even in spite of enthusiasm and intelligence. In a word, on the lower rungs of the architect's ladder, there is no room for the man who cannot draw.

Now it is the practical experience that we gain in an office that is the really essential thing for the designer—that and the study of the work of those who have gone before us. Accomplished draughtsmanship is only accidently essential—it is the means by which we attain to the really essential things.

George Edmund Street in one of his Royal Academy lectures commented on the fact that "Men built magnificently when they drew but poorly." It was only in quite modern times that it became necessary for a paper version of what was proposed to be built, and our business today consists very largely in the manufacture of paper versions. When we study the history and development of Architecture we shall realize how tremendous was the change which the Art of building underwent owing to the substitution of this indirect process, (by which one man makes himself responsible for the form and size of every part of a building from a tower to a turnbuckle), for the simple methods of former times.

We must not understand by this that the Gothic constructors did not scheme things out on paper or even that they did not use scale drawings but extant specimens of drawings and work show how very little attempt was made to make paper drawings give anything like a true idea of the real buildings. Drawing was unnecessary then and architecture had certain qualities as a result to which it is beyond the power of modern methods to attain. We must not let our reverence for ancient things blind us to the fact that something also has been gained by the genesis of the architectural draughtman. The men who were responsible for the Mediæval Cathedrals did not sit on a three legged stool in a city office and superintend a score of buildings at once—some of them hundreds or even thousands of miles away.

George Edmund Street somewhere in the inspiring set of lectures above referred to denies that the pencil has any magic power to help the designer when ideas run out or refuse to curdle into form before what the Scotch call the "mind's eye." His experience is not that of the rest of us, and it has even been hinted that had he allowed the pencil to guide him occasionally instead of guiding it so strongly his designs would not have suffered.

The point we are endeavoring to make is this, that facility in drawing—speed in execution, accuracy and sympathy in delineation—is an enormous help in design by the indirect process of paper drawings. This is especially so when we have recourse to the method of trial and failure i. e., drawing in and rubbing out till we satisfy ourselves that the parts of the thing are of the right size to give the impression we desire our work to convey (for the face of a building is like the face of a man in this that the least appreciable displacement of its eyebrows or the exact curl of the brim of the hat alters the whole expression). Even at the initial stage of a design drawings to scale conveying vividly to the practiced mind the idea of the actual bulk of what is under consideration are of utmost use, as till we can realize the size of the whole it is useless to materialize the proportions of the parts. And the longer we work the more we shall realize that design is a question of proportion,—of the sizes of things in relation one another, and that that indispensable but subtle instinct called the sense of scale, can best be cultivated by drawing.

Ruskin says in the work above referred to which it were well for all to read. "Do not therefore think that you can learn drawing any more than a new language, without some hard and disagreeable labor. But do not on the other hand, if you are ready and willing to pay this price, fear that you may be unable to get on for want of special talent." It is indeed true, that persons who have peculiar talent for art, (and by art Ruskin usually means drawing only.) Draw instructively and get on almost without teaching, though never without toil. * * But I have never yet in the experiments I have made, met with a person who could not learn to draw at all ; and in general there is a satisfactory and available power in every one to learn drawing if he wishes, in a decent and useful degree, if his lot in life requires him to possess such knowledge."

Given patience on the one side, and right teaching on the other, the draughtsman can easily be made if he is not born.

To speak personally, my function here is to see that you draw the right kind of things, rather than that your drawing is well done ; but incidentally, I shall, I hope, be able to give you such hints with regard to manner and method of work, as may help you to get the utmost good from the subjects you will study graphically. Later on when the A B C of our architectural language has been learned, in the only way in which an A B C can be learned,— by putting it down on paper,— later on, I say, we shall group the letters into words, and the words into sentences—grammatical sentences, I hope, with meanings in them.

The things that we shall study are the works of our predecessors from "Delos up to Limerick," and to that end we have here a truly magnificent collection of slides, photographs and books, for which we have to thank the wise generosity of Sir William McDonald, and the deep scholarship, sound taste and energy of Professor Capper.

Now we might exhibit, peruse and dilate upon the beauties represented in this collection for weeks on end, without getting further than a general agreement as to the wonder of all this fine old work. The moment we begin to draw examples however, we begin to solve the mystery of how the effects we admire are obtained and what are the real relative proportions of parts which look perhaps equal in our views upon the screen.

Moreover, it is only by drawing that our knowledge of the detail and mouldings of various periods attains to that definite

and concise degree which makes it possible at a glance to know the date of a piece of old work ; and although it is quite immaterial for the designer to know what bishop or king endowed a church or build a chapel, the evolution of past architecture must be understood before a broad and sound view can be taken of the evolution that is going around us to-day, and dates are the milestones in this study. Therefore, on all accounts let us be patient and draw hard, much, truly and finely, and bear ever in mind that for us it is a means to an end, not an end in itself.

So that the facts be true, and the thoughts be right, the handwriting of this lecture is a very minor consideration. Not so in the "handwriting" of our true professional language ; on the technique of our drawing, depends the amount of fact which a given sheet, nay, a given line, or a given dot may have power to convey. Take pride, therefore, in how much truth, both in degree and quantity your drawings contain, and as little pride as your temperament will permit in the intrinsic beauty of your drawings, for, therein lies a deadly snare, as every draughtsman knows to his cost.

ARCHITECTURAL PRACTICE, REAL AND IDEAL.*

By J. S Gibson.

There are many amusing and curious ways of obtaining a practice, and for all of us it is a serious question to determine how to start on our career. But it is to be settled at an early stage, or else it will effectually settle us. Some cut the Gordian knot by leaving the ranks and embarking into the maelstrom of "trade" ; these are wise but inartistic ones. Some rely on the artistic blindness of the general public, and run lucrative drawing manufactories on business-like lines. These are the shrewd and "practical" ones. Some have relatives who are something big in the City of finance or Society, and these push their architectual appendages in the same manner as they do shares, or officers in the army. What Lord Melbourne said about the bestowal of the Order of the Garter, that "There's no damend merit about it," we may safely say that in reference to the practice of these fortunate ones. Some drift into that refuge of mediocrity, an official appointment in a Government office, and in the Office of Works, or such-like departments, do what they can to spread the commonplace over the land ; these can hardly be said to practise, either really or ideally. Some enter into competitions, throwing all their energies and skill therein, in the hope that merit will be rewarded. These are the sanguine ones, and sometimes they are not disappointed. Some enter into partnerships with clever men of business, who "manage" the clients while they manage the office. These are the timid ones, likeable fellows who think the chief end of life is to get a cornice perfectly proportioned or a skirting-board properly moulded. Some attach themselves to the land, and, backed by financiers, erect enormous piles of vulgarly commonplace type, whose chief quality is to bulk, and whose erection in some slight degree justifies the short leasehold system of land tenure ; these are the wily ones. Some develop an absorbing interest in rights of light, and devote precious time to the intricacies of party structures and then pass away full of years and riches ; these are the canny ones. Some renounce art and become crafty, finding that the public will pay more willingly for the abnormal than the artistic ; these denounce style, balance, composition, rythm, grace, and are sharp-sighted leaders of the blind. Some determine to live for art's sake, and usually die for it instead ; these are the foolish and artistic ones.

These are but a few of the thousand and one ways of practising our profession, and each of you must one day settle this great question for yourself.

Turning to the realities of practice one may say "happy is the man who knows nothing of them," for the whims and vagaries of the client are sometimes as difficult to deal with as the prejudices of the architect.

Among the first troubles likely to assail you are the reconcilement of the wants of the client with the amount of money he is willing to spend. In this matter it is well to show as kindly as possible the impracticability of expecting 5,000l worth of accommodation for 3,000l cash. Never estimate your buildings too low ; it will prove easier to have a margin to meet the changing views of your client, rather than a deficit to ask him to wipe off.

Having satisfactorily settled the money question, you can, with a merry heart, set about the designing of your house ; and if your client expresses a strong preference for any unusual disposition of rooms, you must give this your very best consideration, for, after all, he is the person who has to live in them. If you have hit on any particularly good arrangement, do not throw it at the good man, but lead him gently to it, and thereby gain his approval, for this is more often won by strategy than by force. Always be ready with examples of similar cases, and if these are already known to your client so much the better, for then he feels on safer ground ; all clients prefer experience to experiment. When discussing any question never imagine that force of language will atone for lack of reason. You will often find your client expressing his views on the architectural styles, and, if he desires you to design him a house which shall be Palladian Renaissance outside and English Gothic inside, do not regard him so much as a lunatic as one who requires careful treatment, as his appetite for styles may be omnivorous.

Having matured your design and written your specification, do not think that your worries are ended. Under the present system of competitive tendering for work, you may find yourself face to face with a builder who solemnly assures you that Smith's blue lias lime is much stronger and better than Brown's Portland cement, that drain pipes are best jointed with clay, and that footings should rest on the solid earth without the intervention of any concrete under them. Should you meet such a man no doubt you will inform him of your good old crusted prejudices, and stick to the specification. Having taken a firm standing in your dealings with a builder of this kind, maintain this attitude to the end, and you will generally succeed in getting a creditable job for your client, although at some trouble to yourself. But we must not forget that we are paid for the trouble involved in getting our buildings properly erected, as well as for designing them.

One of the surprises of practices in their early stages, is the extraordinarily easy manner in which variations can be made on contracts during execution, so that when the accounts come in they often surprise the architect more than any other person. The apparently innocent suggestion to "omit the moulded beam and side brackets" over an opening, and just "put in a couple of semi-circular arches with a column and two pilasters," has in some mysterious way, been expanded into about five pages of a bill of extras, the total of which makes the architect gasp. The only safe rule in all these matters is to make a drawing and to get a price fixed before any work is done. If, however, you have made the variation without a price having been previously fixed, you may rely upon one friend in your extremity, the quantity surveyor. He is the man who can pull you through. How he does it I do not pretend to know; perhaps he has no bowels of compassion as far as builders are concerned ; perhaps there is some free masonry of which you and I are ignorant ; but at any rate, he will usually succeed in making a bill more palatable to your client and yourself, and we cannot be too grateful to him for these services.

In your dealings with your client, as with your builder, make up your mind on the matter in hand, and never depart from your determination. Do not be so foolish as to expect to get your own way always ; you will be a lucky man if you get it occasionally, but if you show signs of indecision of character, depend upon it, you will never get it at all. Should your client, upon any vital matter, prefer his way to yours, let him clearly know that the responsibility for success or failure rests on him.

If your work be at a distance, and frequent visits are impracticable, do not be surprised at the variations the builder will quite innocently make on your designs. Some of the most charming results are often thus accidentally obtained.

Years ago a fellow architect said to me, "It's a poor design that does not admit of improvement in execution," and the ripening experience of the translation of drawings into solids will suggest the variations that are improvements. Do not worry too much about the finish of your drawings. The work itself is the heart of the matter, and, above all things, do not over elaborate the details of your drawings. A multiplicity of detail does not ensure a fineness of quality, and I had rather see one good architrave round every door of a house than an abundant variety of commonplace sections. You may dash off sketches of facades and interiors ; many of the happiest inspirations are the most evanescent, but as you grow older you will find it harder to let your full sizes go out of the office. These are the final stages in your part of the work and by them you will be, in a great measure, judged.

The requirements of modern civilization are so varied and complex and we live at such a rapid pace, that even the practice of architecture has been invaded by "specialists" who apparent-

* Abstract of a paper read before the Architectural Association in London.

ly imagine that a thorough knowledge of technical details will compensate for a lack of knowledge of the art of their profession. There is hardly any modern pretenders so lacking in justification by their works as that of the architectural expert or specialist. It may be argued that this is the only scientific method of dealing with modern complicated requirements; if so, its scientific efficiency hardly justifies its artistic barrenness. My earnest advice to you is to make your practice cover as wide a field as possible; shun specialism, however lucrative it may appear.

Within the scope of a moderate practice you will find extensive demands made upon your knowledge. Apart from the capacity to design, there must be the ability to design within the limits imposed by the requirements of the Building Acts of London, Provincial and Urban Authorities, to utilize in the best way the properties of steel, iron, and concrete, as well as the older building materials, stone, brick, and wood. You must also be conversant with the latest patents in pavement lights, have a knowledge of the virtues of glass tiling, know the strong features of burglar proof sash fasteners and give a warranty that your door knobs will never come off the spindle.

Besides this all-embracing knowledge that is required of us, a new danger is rising up, born of our advancing civilization. We are now in the glorious days of trusts and combines, when everything is on a colossal scale, especially the capitalization, and no doubt the inherent poverty of our profession is the only thing that, thus far, has saved us. Think of the waste of energy going on in the artistic world to-day, of painters and sculptors creating pictures and statues and trying to find a market for them—often in vain. Imagine the immense saving that could be effected by a Pierpont Morgan buying up the output of Sargent, Whistler, Shennon, Swan, Guthrie, Laverv, Brock, Gilbert, Frampton, and putting these artists on regular employment at a fixed wage, under healthy conditions in a factory complying with all the requirements of the Factories Act, whatever these may be. Saved from the rapacities of the "dealer," in Bond street and out of it, what magnificent works these men would turn out, while the public would no longer have to go to the dealers to be advised as to the safest thing into which they might invest their money, as if works of art were mining shares and dealt in for the rise or fall of an active market. The only bar to the success of such a scheme comes, strangely enough, from the artists themselves.

I have talked so long on some of the realities that little time is now left in which to speak of the ideal practice. It is like the promised land—before our eyes, but never beneath our feet. Of what would such a practice consist? we ask, and every one's temperament will dictate a different answer.

The ideal practice must surely be that which ensures the evolution of the individual in the advancement of his art. To progress along parallel lines with your art must be a desirable thing, though it can hardly be said that, as a rule, our practice affords many facilities of this kind. Some requirements necessary to this end are common to many of us; these may be summarized as follows:

Work which is congenial to our temperament, and in which a healthy interest may be taken.

Time to think out our problems as a whole, and evolve slowly every detail. Absence of all "rush and worry."

An appreciation of the good points in our designs by those for whom the work is done.

A few assistants, good men and true, who will carry the knowledge gained a step further on their own account.

I could guess the young practitioner's ideal to be, that his buildings would turn out as fine as his conception of them, but the hard facts of reality destroy the charm of those imaginings.

I could guess the middle-aged practitioner's ideal to be, to begin again, with all the vigor and enthusiasm of youth, coupled with the matured experience of his years, but this combination is impossible of realization.

I could guess the old man's ideal to be, to be spared to practice for a few years that great art to the threshold of which many years of travel has brought him, but the inexorable summons comes, he steps across another threshold, and the door closes behind him for ever.

As far as the necessities of living will permit us, I think we should do all we can to realize our ideal practice, to advance the science and art of our calling, to do justice to our clients, our builders, and ourselves, and to uphold the honor and dignity of our profession.

PRIZES FOR ENGINEERS.

The Austrian Minister of Commerce has offered prizes of £4000, £3000, and £2000 for the three best designs to be submitted, showing methods of raising and lowering canal boats for an elevation of 131 feet, with the least possible consumption of water, in crossing the watershed between Prerau (Moravia), the head of the March basin, and Altendorf, the head of the Oder basin of the Danube-March-Oden Canal.

The method of accomplishing the object is to be left entirely to the competitors, who are also at liberty to submit proposals for constructing the works in accordance with their designs, so that the competition should appeal to a wide circle of engineers. If the execution of the work is not entrusted to the person whose design is adopted, a premium of £8000 will be given to him, in addition to the prize, when the successful operation of the contrivance has been demonstrated. Information for competitors will be furnished gratis by the commissioner for the construction of water ways at Vienna and by various provincial governors of the Empire; and by various Austro-Hungarian embassies. Plans and drawings must reach the Minister of Commerce by March 31, 1904.

PRESERVATION OF STEEL BUILDINGS.

From a report by Mr. Jas. P. Whiskeman, Assoc. M. Am. Soc. C. E., to the Superintendent of Buildings of New York, giving the results of a careful examination of the Pabst Building, the following deductions are made relative to the conditions necessary to the preservation of steel structures:—That the preservation of steel depends mainly on the protection afforded by paint, or the encasing of members in concrete or lime mortar, and that steel can resist oxidation when these protective coverings have been thorough; that paint is not always reliable in damp walls; that cast iron withstands rust better than steel. The connections of iron and steel are most liable to be attacked by rust, and these should be well painted or covered with a material like cinder concrete. All the unpainted steel-work, tie-rods, hangers, and expanded metal were found rusted more or less, and also the angles and flanges of girders, showing that the paint had in many cases been rubbed off, or had not been coated after fixing. Considerable care and supervision is necessary in seeing that the specified coats are applied. The splice plates of columns are often found to have rusted behind, caused by scraping, or the paint has been rubbed off, so with heads of rivets, which are often rusted before the flanges and webs. All machined surfaces, pinholes, riveted work should be painted or coated with pure white lead and tallow, and after erection another coat of paint is necessary, or boiled oil should be worked into all joints.

The subscriptions to the fund for the erection of the Queen Victoria Memorial in London have reached the sum of £230,000. The architect, Mr. Aston Webb, and Mr. Thomas Brock, the sculptor, are proceeding with the work.

Sir Robert Giffen, in a paper recently presented to the British Association, showed that £223,000,000, or 16 per cent. of the total annual expenditure of the British people is spent for housing, including furniture, coal, gas and water. The speaker "considered the sum to be very large, and that probably in various directions, by individuals and classes, perhaps so much is spent that there is considerable economic waste; but for the mass of the people the housing arrangements are not sufficient for civilized life, or even for good health."

NEW CANADIAN EMIGRATION OFFICES.

The remarkable growth of emigration from Great Britain to Canada has necessitated the erection by the Dominion Government of large new offices in London, England. These new offices, which were opened in April, are located at Charing Cross, in the centre of the Metropolis. They comprise a very imposing block of buildings of commanding appearance, and should proqide adequate accommodation for the purpose for which they have been erected for many years to come.

The accompanying illustration shows a portion of the interior of the ground floor. It is partitioned off for various departments. The office of Mr. T.R. Preston, the Canadian Commissioner of Emigration, is on the ground floor. All the fittings are of Canadian wood, comprising bird's-eye maple, cherry, ash, and oak, the fittings having been mainly supplied by the Office Specialty Company, of Toronto, and the Canadian Office and School Furniture Company, of Preston. All the offices are admirably arranged to meet the work of this department, which now comprises quite a considerable staff.

New Canadian Emigration Offices, London, England.

THE BUILDING TRADE AND MR. CHAMBERLAIN'S PROPOSALS.

The building trade of this country is very directly concerned with Mr. Chamberlain's fiscal proposals, says the London Builders' Record. We are largely dependent on other countries for certain building materials. Brick and stone are home products and may be set on one side; but wood, cement, joinery, rolled iron joists, glass and numerous other goods are imported in great quantities from countries which would be penalized by Mr. Chamberlain's tariffs. A few weeks ago we published some figures showing how the McKinley tariff of 40 per cent. on manufactured granite goods had affected the Aberdeen trade, the total value of granite shipped from that port to the United States having dropped from £112,382 in 1891 to £19,710 in 1902: so that the more favourable tariffs prevalent with our colonies (Canada being only 20 per cent. and Africa 10 per cent.) has led granite merchants to very seriously consider the Colonial Secretary's scheme. Then as regards cement. During recent years the English market has been invaded with foreign cements: in 1901, more than 220,000 tons came from Germany, Belgium and the United States, as compared with 105,000 tons in 1900. America is likely to be a great competitor for the cement market of Canada; the latter country having largely deserted us of late in favour of the enterprising nation next her boundaries. In this latter connection account should also be taken of the rapid growth of cement manufacturing in Canada, the Canadian product having largely displaced the imported article.

THE COLOURS OF STAINED GLASS.

Mr. Walter Rosenhain points out, says the Builders' Record, that the loss of the secret to produce the tints of old stained glass is not indeed a loss, for the secret was never our's, but was always one of Nature's. Glass changes its colour under the influence of light, as anyone may perceive who will glance upward at an old railway terminus roof and notice how some of the panes have changed from their original greenish tinge to yellow or even pink. A large number of experiments have been made on this subject, and Professor Gaffield has carried out a series of tes's, lasting in some instances over thirteen years. He found changes of colour, in what may be termed "white" glasses, as follows:—From white to light yellow, light green to yellowish green, brown and greenish yellow to various tints of purple, light green to light blue, and in some cases merely a deepening of the original tint. In the majority of coloured glasses he found little alteration except in violet and brown tints. Nevertheless, when ancient coloured glass is removed from its setting it is often found that portions of the glass which have been protected from the light are of a different tint from those portions which have been freely exposed. There can be little doubt, therefore, that we do not now see ancient glass windows with the colours they originally possessed. The change of colour is probably due to a change in the state of oxidization of the manganese and iron present in the glass. Professor Currie recently showed that the rays from radium have a powerful and ready effect in changing the colours of certain glasses.

—THE—

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(With a Weekly Intermediate Edition—The CANADIAN CONTRACT RECORD).

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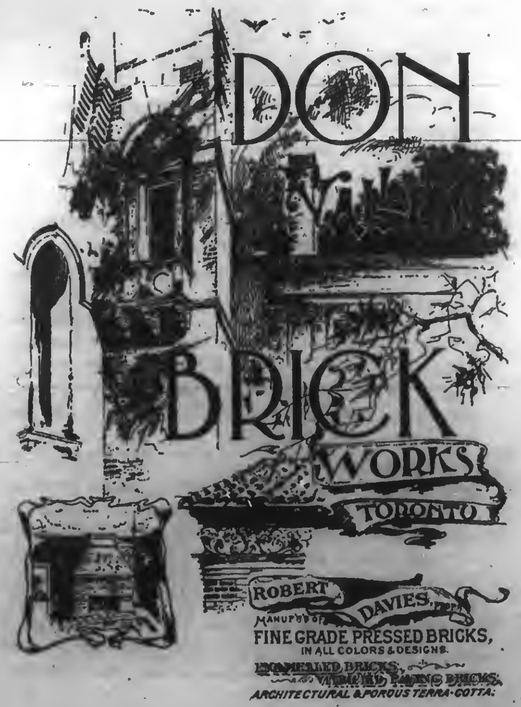
NOTES.

The method has been adopted in the United States in the case of certain classes of difficult undertakings of building with profits in the form of a commission on labor and materials. A firm of New York contractors who agreed to erect a large stone building at the actual cost of materials and labor plus 8 per cent. commission, binding themselves to the employer that the total cost including their commission and architects' fees should not exceed 20 cents per foot, are now bringing suit in the courts to determine a dispute as to what is due them.



LEGAL

In the action for damages brought by the Metallic Rooling Co., of Toronto, against Local Union No. 30, of the Almalgamated Sheet Metal Workers' International Association, Mr. Justice McMahon has decided that the officers of the local union are properly qualified to represent the other members of the local union, under rule 200. "That rule gives no power to order that the officers of the local union shall represent the other persons constituting the association, which is a foreign body, having its headquarters at Kansas, and under whose jurisdiction the whole of the local unions in the United States and Canada are placed." Order made that the individual defendants shall represent the other members of the local union. Costs in the cause.

Curiously enough the British Workmen's Compensation Acts which are mainly concerned with accidents to workmen, do not contain a definition of the word "Accident". A recent decision of English courts, however, gives us the legal interpretation placed upon it by the courts. A case which turned on the meaning of the word (Fenton v. Thorley & Co., Ltd.) was decided recently in the British House of Lords. Owing to some defect in a machine, a workman was injured in endeavoring to make it act. The County Court judge held there was no accident arising out of and in the course of the employment. The same view was taken in the Court of Appeal. Lord Macnaghten objected to the belief which prevailed in the Courts that there must be something fortuitous in the circumstances in order to constitute an accident. A workman acted stupidly and was injured, and unless serious and wilful misconduct could be proved he obtained compensation. Another did his very best, acted with energy and thoughtfulness: he was declared to be outside the Act, as the fortuitous element was wanting. His lordship considered the word "accident" should be interpreted in the ordinary sense. In conclusion he moved that the decision of the Court of Appeal and of the County Court judge be reversed, with costs in both Courts, and that the action be remitted to the County Court with a direction to the judge to ascertain the amount of compensation to which the appellant is entitled.

The general practice in building, that if the employer is dissatisfied with the manner in which a contractor is carrying out his work he may, after due warning, engage any other person to complete the work, has been once more upheld in Scotland. In a case lately heard, says the Builders' Reporter, the plaintiff was accepted for a contract to carry out the joinery work in three blocks of buildings. He claimed £210 19s. for work in connection with the buildings, and also £500 as damages for breach of contract in respect of the architect having taken the contract out of his hands after the roofs of the buildings were on. The owner of the buildings, who was the defendant, stated that he was willing to pay whatever sum the architect might certify to be due. The position he took up with regard to the claim of damages was that the architect had power under the contract to take the contract out of the contractor's hands, and that he was justified in doing this owing to his dissatisfaction with the progress made with the work. The claim for work done was referred to an independent architect, who fixed the amount at £187 19s ½d. This sum was awarded to the contractor. The claim of £500 damages for cancelling the contract was dealt with at some length. The Sheriff-Judge, in his decision, found that the plaintiff was not entitled to damages for the following reasons;—That he did not fulfil the terms of the contract, but that at several stages of the work, in consequence of his materials not being forward, he caused serious delay and inconvenience to the other tradesmen, especially to the mason, and retarded the progress of the work. After several delays caused by the pursuer, it became apparent that he was not carrying on his work in such a way as was compatible with its being finished at the earliest possible date; that the defendant's architect, after reasonable warning, wrote to the plaintiff intimating that the contract was taken out of his hands; that the architect was justified in terminating the contract. The case exemplifies the disadvantages of splitting up the contract, for the speed of progress is thereby regulated by the slowest. For instance, the mason had to take his men for three weeks from the walls owing to the absence of joists. The delay about the joists was caused to a large extent by the plaintiff supplying joisting of an inferior quality to that which was specified. According to Mr. Morton, the wood merchant, he ordered joisting of a grade inferior to that specified, and at a price at which the specified quality could not be supplied. There was a similar delay when the walls were ready for the second-floor joists. The ceiling joists were not even ordered from the timber merchant at the stage when it was usual to lay them. The evidence was overwhelmingly against the plaintiff, and the decision could not do otherwise but reflect that fact.

The builders of high chimneys in Germany are now using a mortar composed of a mixture of cement, lime and sand (in the proportions of 1, 2 and 6) for the upper portion of the chimney stack, where the gaseous products of combustion of the fuel are comparatively cool; while for the lower portions of the stack the proportions are 1, 2½ and 8. If the lime is hydraulic the proportion of the cement may be reduced; but if the sand is very sharp the proportion of cement must be increased. For the cap of a tall chimney stack the proportions of the ingredients of the mortar may be altered with economy and advantage. In German practice the mortar is composed of cement, lime and sand; in the proportions of 1, 1 and 4. Mortar made of cement and sand alone is not at all suitable for tall chimney work, because it does not resist the action of heat well and is attacked by carbon dioxide, of which there is always a large quantity present in the fine gases; this is especially the case in the presence of moisture, and, of course, steam is always present in the gases found in a smoking chimney.

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STANDARDIZING OF BRICKS.

At a conference representing the Royal Institute of British Architects, the Institution of Civil Engineers and the Institute of Clayworkers held in London on June 19th last, approval was given to the proposal that in future bricks should be made to a standard size as follows :

1. The length of the brick should be double the width, plus the thickness of one vertical joint.

2. Brickwork should measure four courses of bricks and four joints to a foot.

Joints should be ¾ in. thick and an extra 1/16th, making 5/16ths for the bed joints to cover irregularities in the bricks. This gives a standard length of 9¾ in. centre to centre of joints.

The bricks to be measured in the following manner :

A. Eight stretchers laid square end and splay end in contact in a straight line to measure 72 in.

B. Eight headers laid side by side, frog upwards, in a straight line to measure 35 in.

C. Eight bricks, the first brick frog downwards and then alternately frog to frog and back to back, to measure 21½ in.

A margin of 1 in. less will be allowed as to A, and ½ in. less as to B and C.

This is to apply to all classes of walling bricks, both machine and hand made.

NOTES.

White walls are the latest mania of the art decorator, says the Daily Graphic. A good many smart houses are being done with walls of white Lincrusta all the way up—the hall, staircase, and rooms all to match. The friezes and dados of the library and dining-rooms are sometimes made of old oak, and the white walls make an excellent background for oak furniture.

The Toronto Chapter of the Ontario Association of Architects and the Toronto Engineers' Club, have decided to hold every Monday joint luncheons. Formerly the members of each society met separately for this purpose. The new arrangement will no doubt promote acquaintance and sociability and enhance the general interest and success of these gatherings.

There is no branch of masonry construction which has experienced greater advances within the past few years, says Engineering Record, than Portland cement concrete. Applications for it are constantly being found in more or less new conditions, either with or without steel reinforcement. Some who formerly were apprehensive in regard to the weathering properties of its exposed surfaces have found that it may be made durable even under the most trying exposure. The best methods of its preparation have been found to make it so nearly watertight that it may easily be given that highly desirable quality for all practical purposes.

A writer in the "Yorkshire Post" observes that it is a curious fact, and one which emphasizes all the rest, that the most artistic of modern houses are those of the very wealthy and the very poor. The rich are building their own; the poor in a few favored places, are having their's built for them, and in their different ways they are the nearest approach we have to model homes. Between these extremes comes the great wilful and inartistic middle-class, for whom there is being provided on all hands architecture that would be laughable where it not so sad. Scores of examples of it may be seen in the suburbs of any growing town—painfully modern villas of every possible degree of ugliness and inadaptability. In general they are supposed to be imitations of various "styles" of architecture, but here and there may be found a case of absolutely original eccentricity.

With the object of forming a great dam to provide a water supply for the city of San Francisco, a great section of mountain was recently torn off by 10,000 lbs. of powder, lifted several feet straight up, and then pushed bodily forward 40 ft. or 50 ft., then falling 125 ft. into the desired position. On the surface and in places through the mountain side were placed big deposits of giant powder for the purpose of shattering the mass and lifting it up. According to plans the powder when it exploded would hurl the mass straight forward, making a bridge of granite across the gorge and blocking the stream. The plans were carried out with the greatest care, and with a successful result. When the dust cleared away, it was found that the powder had dislodged a mass of rock 400 ft. up and down stream and an average of 60 ft. in height, completely bridging the canyon. The engineers estimated that the amount dislodged weighed about 150,000 tons.

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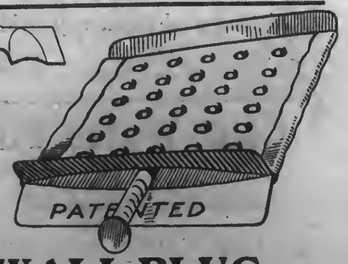

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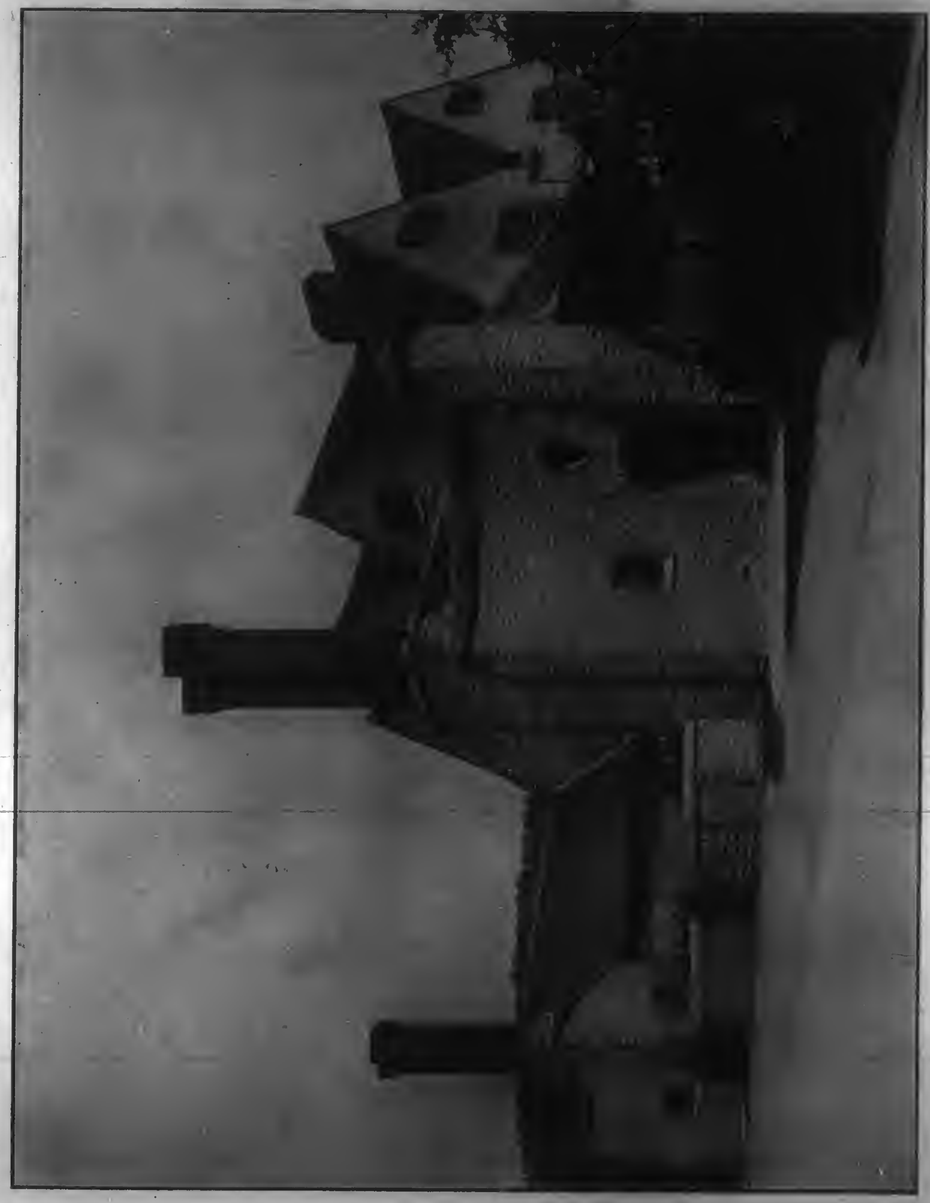

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HOUSE AT FREDERICTON, NEW BRUNSWICK

The Canadian Architect and Builder

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ILLUSTRATIONS ON SHEETS.

The Dining Room, Avonwood, Bournemouth, England.—Brewerton & Sheppard, Architects.
St. Mary's Church, Berlin, Ont.—A. W. Holmes, Architect.
House in Maple Avenue, Rosedale, Toronto.—Eden Smith, Architect.
House in St. George Street, Toronto.—Eden Smith, Architect.
Drawing Room and Library, House in St. George Street, Toronto.—Eden Smith, Architect.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Institute of Civil Engineers, London.—Sir Charles Barry, Architect.
The Knole, Bournemouth, England.—The late J. D. Sedding, Architect.

ILLUSTRATIONS IN TEXT.

Drawings Accompanying Notes of Travel.
Entrance to New Majestic Theatre, Toronto.
Entrance to Grand Opera House, Paris.
McIntyre Block, Winnipeg.

CONTENTS

Editorial 175-176
Notes of Travel 177-178
The New Majestic Theatre, Toronto 179
The Improvement of the Capital 180
C. A. & B. Students' Competition 180
Correspondence—
Ventilation of Office Buildings . . . 181
Hollow Building Block Construction . . . 181
Effects of Cinder Concrete on Iron and Steel . . 182
Building Conditions in Hamilton 182
Preserving Stonework 182
By the Way 183
Method of Drying Out Damp Walls 183
Architectural Classes in Toronto 183
The Styles of Architecture and Styles in Architecture . 184
How to Make a Lawn 185
Publications 185
Architectural League of America 186
Ontario Association of Architects 186
The Toronto Isolation Hospital 187
Moving Carrara Marble 189

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A City Architect For Toronto.

Mr. Robert McCallum, for many years on the engineering staff of the Department of Public Works of Ontario, has been appointed city architect of Toronto. Apart from the peculiarity of having a civil engineer as city architect, Mr. McCallum's knowledge of constructional methods and materials should qualify him to pass upon the structural fitness of proposed new buildings, and to decide whether in structures new or old the construction is safe. We presume it is not the intention to place the designing of important city buildings in his hands. If so, why that is a matter requiring entirely different qualifications. The completion and adoption of the proposed new building by-law should follow as a natural sequence the appointment of a city architect. Mr. McCallum should lose no time in urging the City Council to deal with this important matter.

Sand for Building.

A company who are carrying out some dredging contracts in the neighborhood of Toronto, are sending out circulars to the architects of that city offering for sale what they call "water washed sand" for building purposes. A higher price is asked for this material with the high sounding title on the ground that the "water-washing" (whatever that may mean) ensures a higher standard of quality. Whether such is the fact or not, we cannot but admire the ingenuity exercised in seeking to find a profitable outlet for what would ordinarily be regarded as a valueless product. In this connection it may be mentioned that the lake sand used for building purposes in Toronto varies greatly in quality according to the location from which it is obtained. In some places on the lake shore the sand is clean and sharp, while in others it has a powdery coating which greatly lessens its value when used with lime and renders it altogether valueless if used with cement.

The New Toronto Public Library.

The City Council of Toronto have approved of a down-town site for the proposed new public library building. It has also been settled that the reference and circulating libraries shall be housed in one building. This is a wise decision. The best use will be made of Mr. Carnegie's liberal gift by concentrating the expenditure in a well designed and planned building on a site convenient to the business center of the city. If proper care is exercised the building itself will form an interesting addition to the public architecture of the city, while being most convenient of access to a majority of all classes of the citizens. The

council should follow up its first wise action in this important matter by taking steps to secure the best possible design and plan for the building. Care should be taken to prevent the commission going into the hands of "the man with a pull." The best results would probably be secured by a limited competition among Canadian architects, governed by conditions approved by the architectural associations of Ontario and Quebec.

L'Art Nouveau in Architecture.

The merits of the so-called new art for any purpose are open to question. Its employment in any form of construction seems to be a violation of the principles which are generally recognized as underlying all work of this nature. Apart perhaps from its sparing employment in decoration, it should have no place in architecture. Yet it has found its way, and indeed has become a leading characteristic of recent work of not a few of the architects of Continental Europe. The results cannot be regarded as other than deplorable. The principles of construction, of proportion and of good ornamentation are all set at defiance by architects whose fancy has been caught by the new art. It is a cause for thankfulness that the craze thus far has not taken possession of architects either in the United States or Canada. It is to be hoped that notwithstanding the influence of the French school on the architecture of the United States, it may not be considered necessary to copy the new art vagaries introduced by French and German architects. Some of the new buildings embodying these characteristics recently erected in France and Germany should serve as examples sufficiently horrible to deter architects with a reputation to make or preserve from having anything to do with this fad.

Casement Windows

The artistic effect of casement windows has always been appreciated by Canadian architects, but only within the last decade has their use been ventured upon in domestic work. The earlier generation of architects were taught that the casement window was not adapted to and should not be used in this climate. They in turn taught the doctrine to their apprentices. The latter, constituting the practitioners of to-day, have to a considerable extent departed from these teachings, and are using the casement window in house architecture with very pleasing results. It is nevertheless true, that difficulty is experienced in making this style of window weather-tight in this climate. The source of the trouble lies in the use of wooden frames which are bound to shrink. In England steel frames are used and this would no doubt overcome the difficulty here. In view of the extent to which casement windows are now being used in new houses, especially in Toronto and vicinity, where the climate in winter is moderate, there would seem to exist an opening for some enterprising manufacturer to place on the market a steel casement window frame.

Foreign Recognition of Canadian Skill.

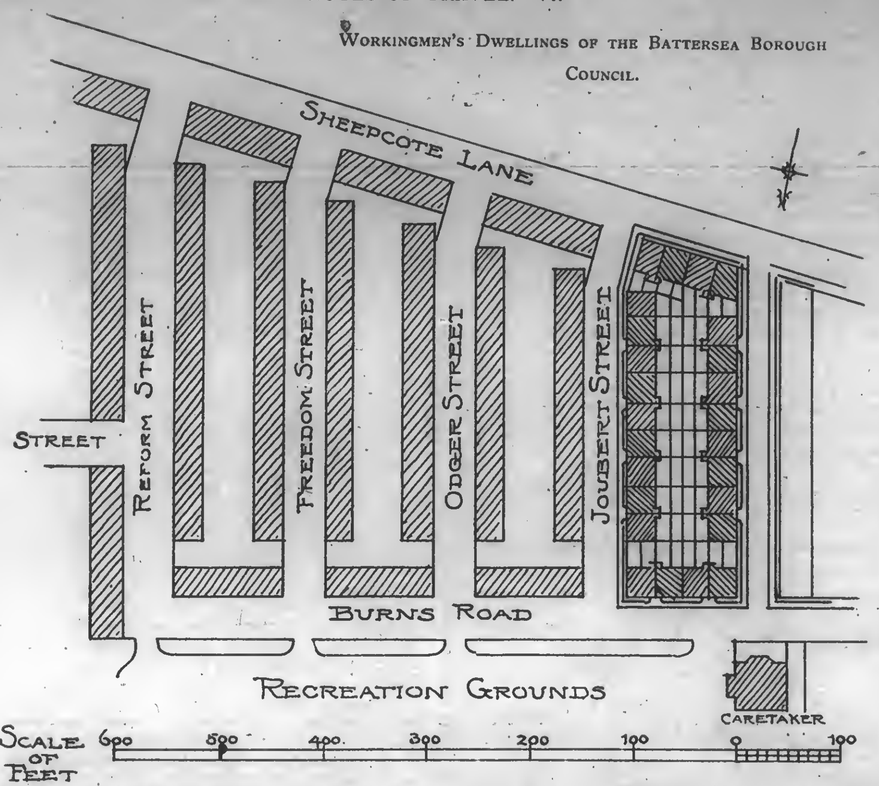
A Canadian firm of stained glass manufacturers have recently received from the United States several commissions for memorial windows. The first of these commissions came as the result of an inspection of work done in Canada, and subsequent ones because of the satisfactory manner in which the first work done in the United States was carried out. American opalescent glass was used in this work. An import duty of 20 per cent. had to be paid on the raw material, and an export duty of 45 per cent. on the manufactured article. This duty was added to the price and was paid by the purchaser. That the customer should have been willing to pay this extra price for Canadian work is highly complimentary to Canadian skill. Notwithstanding that a great deal of American ornamental glass is purchased in Canada, every obstacle was thrown in the way of the Canadian firm seeking to do business in the United States. In this connection it seems proper to refer to an occurrence which, if the facts are as stated, demands explanation by the Canadian Minister of Customs. It is said that a United States firm of ornamental glass manufacturers lately received an order amounting to about $10,000 for memorial windows to be placed in a church in Montreal, and that the duty of 30 per cent. paid on these windows was afterwards refunded by the government. If the facts are as stated, the action can only be designated as an outrage. The refund is said to have been made because it was represented that the windows were to be used for religious purposes. The tariff, however, makes no such distinction, and no official should be permitted to grant privileges outside of its provisions. Otherwise our so-called National Policy is a farce, and in its administration great injustice may be done.

Architectural Accessories.

The growth of wealth and travel is resulting in a higher appreciation by Canadians of the refinements of life. Domestic architecture especially is receiving greater attention than at any previous period during the present generation, and in consequence is showing great improvement. Architects who now aspire to be leaders in their profession must not only possess a knowledge of how best to meet the varied requirements of modern commercial and domestic life, but in addition must have the artistic faculty highly developed, so that they may be able in their designing and planning to combine beauty with utility. The fact is also becoming recognized that good architecture can only appear to best advantage when in its proper setting. Therefore, due attention must be given to architectural accessories, which term includes questions of site and proper arrangement of grounds. This phase of building to which so much thought is given in older lands is now receiving greater attention from Canadian architects and building owners. That there is yet plenty of room for improvement in this direction is evidenced by the ugly unpainted high board fences used to separate one property from another. Such fences are a serious disfigurement to many otherwise attractive houses erected in good residential localities in Toronto this year. Are these ugly fences the result of false economy on the part of owners who, after spending thousands on their buildings, spoil the effect by trying to save a few dollars on the fencing, or is there available to the architect no better method of partitioning properties? Whatever the cause, the disappearance of the unsightly board fence would be welcomed as marking another advance in architectural development.

NOTES OF TRAVEL.—VI.

Workingmen's Dwellings of the Battersea Borough Council.

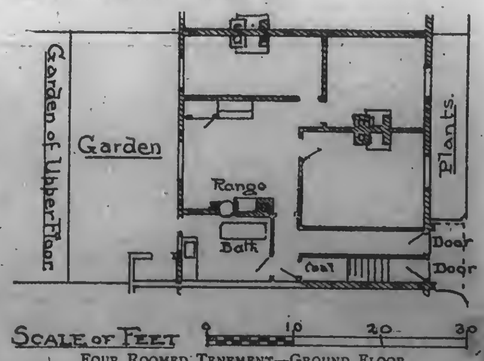


The Latchmere Estate buildings in Battersea are a good illustration of two things—workingmen's dwellings and municipal contracting. They are the work of the municipality of Battersea and occupy a portion of a piece of public ground belonging to the Borough. This land was originally let out in gardening allotments at a rental which, as it brought in only £16 a year to the municipality, must have been merely nominal. As not much good was coming of this (no doubt, under a system of gardening in a small way, the land did not improve), the idea occurred to someone that the ground might be turned to greater public advantage by building upon it dwellings suitable for working men.

Battersea is a borough in which working men are powerful. It is the constituency of Mr. John Burns, and, whether or not he conceived the idea, he was a principal promoter of the scheme and the mover of the bill in Parliament to authorize the work.

The result is evidently a financial success. The 315 dwellings, which are being erected now, are taken up as fast as they are finished and promise, when all are completed and occupied, to return an annual rental of £7000, instead of £16 as formerly. This means present work for residents of the borough; good homes for 315 families among them; and an application of the annual expenditure in rent by these families so as to reduce the poor rate of the borough to the extent of £7000 a year.

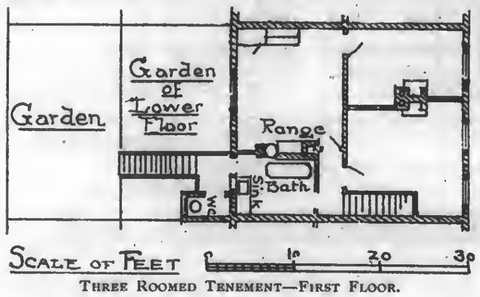
The trapezoidal piece of ground occupied by these buildings is about 800 ft. in greatest length, by 550 ft. in greatest depth. The houses are built in rows and the streets are close together, leaving only enough land in the interior of the blocks to give for each dwelling a drying-ground about 10' 6" by the width of the house. The streets are 40 ft. wide including the width of the sidewalks. In apparent width they are 4 ft. wider on each side, as the houses stand back that much to allow for the projection of the granolithic slab which protects the entrance doors. The granolithic paving of the sidewalks is carried through to the walls of the houses as a preventive of damp foundations, but the 4 ft. space is to be railed off and, it is said, filled with plants in tubs, to brighten the fronts. The pieces of ground at the back will probably be cultivated on each side of a central pathway, for Englishmen are great gardeners even in London. Something of the kind will be needed to beautify the interior of the blocks; the interior of the only block that is completed at present looks too much like a cattle market—all fences.



Four Roomed Tenement—Ground Floor.

The dwellings are in flats, but are only two floors high. Perhaps this is their most noteworthy point. It represents the teaching of experience, that if flats, of this kind, are to have anything of the self contained character of a home, they must have each a separate entrance direct from the street to the dwelling. A common entrance is apt to take its character from the worst occupant of the building; the sense of home for the best occupants, and the safety of home for their children is neutralized. The bottom idea of these flats is a separate entrance for each floor. The doors stand side by side on the front under one arch and one canopy; and the entrance ways run side by side, taking up three feet of room apiece. It is evident that in these circumstances, the number of entrances must be limited; and therefore the number of floors. The limitation of two floors is evidently going to pay sufficiently, and it is the making of the buildings from the point of view of the residents. The streets and the space between the houses inside of the block, though not wide, have an open appearance; and it is pleasanter and more convenient to live near the ground than to be cut off from it by flights of stairs.

There is also, in being only 10 feet up, safety from danger by fire—though these buildings are nearly fireproof. Their stairs are of wood, but there is a second stair from the scullery to the garden, starting from a landing of concrete.



Three Roomed Tenement—First Floor.

The exterior walls are 9″ brick; ground floor partitions which carry floor beams are 4½″ brick; other partitions are 3″ brick nogged or made of a concrete of breeze and cement, plastered with a waterproof plaster.

The lower floor is concreted on the ground; the upper floor has 5″ steel I beams, about three feet on centres, fitted in with a concrete of breeze and cement. The method is simple:—boards are pinned up tight to the underside of the beams and the concrete is filled in between the beams, flush with their tops.

It takes about 12 men to lay a floor expeditiously: 5 mixers at the door shovel the stuff into the house; it is further mixed by being passed on by 4 more men, who shovel it one to another, until it reaches the 3 layers, who ram it in between the beams one bay at a time. The wooden flooring is nailed directly to the concrete.

The roof is quarter pitch, covered with slates on battens. External openings have sills and lintels of granolithic cement, and the entrance door canopy is a granolithic slab about 6′ x 4′ supported by corbels of the same material. There is no other exterior detail. The only wood visible on the outside is that of the frames, doors and sashes. It is good solid building likely to last long and to keep neat.

All the conveniences, by the way, are supplied. For heating there is no occasion: the kitchen range supplies all the heat that is necessary for ordinary cold weather, and fireplaces are provided in all other rooms to give whatever additional heat is necessary. Hot water is supplied to the bath from the kitchen boiler, which is supplied from a tank connected by a ball-cock with the water main. The water comes from an artesian well bored to supply these buildings and, I believe, the municipal baths adjoining. The lighting is electric, and is also a municipal work. Each house is provided with a penny-in-the-slot meter. It is found to be most satisfactory for the user that he should pay as he goes, and experience in the other system seems to show that a penny meter will give enough current for a day's supply of light to a house of this kind. If not, it is not a case of sudden extinction and feeling for a slot in the dark; an automatic warning of the approach of the cut-off gives notice, in time for the insertion of a new penny while the light continues.

The cost of all this work is about sixpence a cubic foot. This price is probably rock bottom. The borough does almost everything for itself, and the Superintendent of Works is practically running a large contracting business under an undertaking to make his work both cheaper and better than any other; for there will be private contractors, ratepayers in the borough, ready at any moment to present at his head the double-barrelled proposition—"Why should we pay for work a higher price than we charge for it?"; "Why should we not have this work to do, since we can do it better?"

The manufactured woodwork all comes from the municipal factories; and can be easily undertaken by them for the rows of buildings progress in consecutive stages. Most of the other work is done on the ground and consists—besides the ordinary works of bricklaying, setting beams, roof building and slating—chiefly of operations in cement: floor laying, making sills, lintels and door protections, also slabs for partitions and paving. The breeze which is the foundation of all the works in cement comes from the municipal destructors where all refuse—garbage, ashes, and even (Oh joy!) tin cans—is burnt up together and makes a slag which is used in paving and other works. Some of it is brought to the Latchmere buildings and ground and sifted for the various works in cement; making both the rough basis of the ground floor and pavement concreting, the strong though finer aggregate of the flooring on steel beams, and the fine stuff that goes into the partitions. The sills, lintels, door-heads and pavement flags are concreted with granite dust.

Every building is put together with the same standard parts; so that the construction, though good, is economical. It is not likely that so low a cost per cubic foot can be reached by any work, as good, on a smaller scale. There is of course no paring of wages in the borough that elects John Burns. There is a 48 hour week with wages running from 10½d. to 1s. an hour according to skill.

The proof of a building is in the renting. One of these four roomed dwellings—the larger size—rents for 10 shillings ($2.42) a week. The rent is charged on the land as well as on the building, although the land cost nothing; but the London County Council, which lends the money for municipal improvements within the area it governs, required the estimate on which the loan was based to include a charge for land; valuing the whole site at £7000, which I made out to be between $8 and $9 a running foot of the frontages.

The actual value of the land to the tenants is doubled by the reservation of half the estate as an open space in connection with the buildings. Since the tenements are proving a success there is some talk of occupying this space with a second batch of buildings. Of course it would be a nice thing to have more good residences for workingmen in the borough, and to have their rent paid into the borough pocket; but to accomplish this by crowding seems an insufficient ending to an estate which lays claim, in the name of its streets, to such ideas and personalities as Freedom and Reform, Burns and Joubert.

I do not know who Ogden was, but may his memory be sufficient to preserve the land from such a catastrophe.

A reasonable compromise may perhaps be found in surrounding the space with houses. It would cut 50ft. off the ground all round, but there would be some 50 additional houses, and perhaps the place would look the neater for it, for the fronts of their own houses, in an orderly arrangement, would make a better boundary than the random backs of the neighbouring buildings.

W. A. Langton.

Entrance to New Majestic Theatre, Toronto.

THE NEW MAJESTIC THEATRE, TORONTO.

The accompanying engraving reproduced from a photograph shows the facade and main entrances of the new Majestic Theatre on Adelaide street west, Toronto, as they appeared a few days before the opening of the building for public performances. The building occupies the site of the Toronto Theatre. The destruction of that theatre by fire only a few months ago might have been expected to result in the erection in its place of a thoroughly up-to-date structure. How far this expectation has been fulfilled from the standpoint of artistic design the illustration will show. The theatrical profession is supposed to be composed of artists. Theatre buildings should therefore be artistic in design, and in many cities of the United States and Europe they stand in the front rank in this regard. The most notable example is the great opera house in Paris designed by Garnier, the principal entrance to which is shown herewith. Not only is the new theatre in Toronto not artistic, it is so conspicuously ugly as to be a positive eyesore.

On the ground of public safety also the building seems to be deserving of criticism. Notwithstanding the fate of its predecessor no attempt seems to have been made to render it even fire-resisting, not to say fireproof. Wood and plenty of it has been employed in the construction. The arch above the main entrance is a mass of wood veneered with plaster. In the event of the building being attacked by fire, we fear it would prove a veritable tinder box.

On either side of the main entrance are smaller entrances to staircases leading to the galleries. These staircases, which are steep and narrow, appear to be enclosed on one side by a plaster wall and on the other by the outer wall of the building. Doors opening off these staircases on both floors give access to and exit from the galleries. In the event of a fire or panic the occupants of the galleries might find their only exit by the staircase blocked by smoke and flame. The height, narrowness and steepness of these stairways would in such an event be likely to lead to many persons falling and being trampled to death.

In cases wherein damages have been sought for injury or loss of life occasioned by defects in public buildings, the Canadian courts have interpreted the law to mean that in the construction of such buildings every human precaution must be taken to prevent accident. It will scarcely be contended that this new theatre comes within reasonable distance of this standard.

The actual responsibility for the safety of such buildings, however, lies with the civic authorities and officials. If Toronto had a properly framed building by-law and competent officials to enforce it, it would not be possible for fire traps to be erected. The existing building regulations are in such a chaotic state and so out-of-date as to be almost useless. The only clause we have been able to find bearing on the construction

Entrance to Grand Opera House, Paris.—H. Garnier, architect.

of public buildings is the following, adopted January, 1890:

"No church, hospital, college, school, hall, theatre or other building of a like nature * * * shall be used or hereafter constructed unless the same contains such a number of doors, halls, stairs, stair railings and other means of egress of sufficient size and strength as in the opinion of the Inspector of Buildings shall afford ample facilities for free and rapid egress in case of fire, panic or other cause. No such building shall be erected or altered until the plans * * * shall be submitted to the Inspector of Buildings and certified by him as conforming to the requirements of this by-law."

It will be seen that the character of construction is not defined, but everything is left to the opinion of the Building Inspector. What that opinion is worth may be learned by an examination of the theatre building under present consideration.

There is no more important duty confronting the new city architect and the City Council than that of preparing and adopting at the earliest possible moment an up-to-date building by-law.

THE IMPROVEMENT OF THE CAPITAL.

The Ottawa Improvement Commission appointed to disburse the yearly grant of $60,000 by the Dominion Parliament for the beautifying of the city are going about their work in a wise manner, by first securing the advice of an expert as to what should be done. For this purpose the Commission engaged the services of Mr. Frederick G. Todd, landscape architect, of Montreal, whose preliminary report is before us.

Mr. Todd points out that the proposed improvements should be national in character, as befitting the capital of the nation. He properly emphasizes the wisdom of looking far enough ahead to provide for the future requirements of a city which he estimates will in fifty years have a population of 300,000. The exercise of such wise foresight will save large sums of money which would otherwise have to be spent in the future in removing obstacles out of the way. The report states that while Ottawa can never be "the Washington of the north," as some writers have predicted, because its topographical situation is entirely different, its location and surroundings are such as admit of development on an even grander scale.

As a capital city it is suggested that the parks and open spaces should be numerous with ample boulevards and parkways skirting the different waterways as well as connecting the principal parks and public buildings.

The principal suggestions are that forest reserves be secured in the Gatineau Valley and at Marsh Lake, which should contain specimens of the trees comprising the once great forests; that suburban parks be established as follows: 100 acres adjacent to Rockliffe Park, including the shores of Hemlock Lake, and east of Rockliffe Park along the river as far as the rifle range; just below Remous Rapids at the west end of the city; on both sides of the river west of Herdman's Bridge, at the south end of the city; and at the mouth of the Gatineau river extending to Pond Creek for the adjoining city of Hull.

The report suggests the location of connecting boulevards, including a drive along the bank of the Ottawa river between Rideau Hall and the Parliament Buildings, which, on account of its magnificent views would become famous the world over. This boulevard should terminate in a monumental circle which could be made to form in connection with Dufferin Bridge, a dignified approach to the Parliament Buildings. To this end Dufferin Bridge should receive proper embellishment. Emphasis is laid on the necessity for the preparation of a proper plan showing in detail how these improvements should be carried out in advance of any action being taken in that direction, also the importance, once a plan is decided upon, of allowing no departure therefrom.

C. A. AND B. STUDENTS' COMPETITION.

The publishers of THE CANADIAN ARCHITECT AND BUILDER invite architectural students in Canada to submit designs in competition for a Public Library to contain 10,000 volumes.

The Library is to be built in a small park in a country town.

The drawings required are: two elevations, one sectional view and plans of each floor. The plans, section and one elevation must be drawn in strong lines with pen and perfectly black ink on white cardboard or drawing paper. The principal elevation must be a wash drawing, the colors used being such as can be photographed. In making this drawing of principal elevation competitors are requested to bear in mind that to ensure satisfactory reproduction strong contrast in shading is necessary. It is required that the drawing of principal elevation shall also indicate the character of the surroundings and principal approach to the building.

Drawings should be made to ⅛ scale in a manner to permit of reproduction within the limits of a double page of the CANADIAN ARCHITECT AND BUILDER, i.e., 10x15 inches in size.

Competitors should state the materials proposed to be employed in construction.

Drawings for this competition should be signed with a motto only and be accompanied by a sealed envelope bearing the same motto and enclosing the full name and address of the designer and the name and address of his principal. They should be sent FLAT by post or express, charges prepaid, addressed "CANADIAN ARCHITECT AND BUILDER, Toronto, Canada—Students' Competition," and must reach this office not later than noon on Saturday, January 16th, 1904.

The members of the Educational Committee of the Toronto Chapter of the Ontario Association of Architects and the Toronto Architectural Eighteen Club have kindly consented to judge the designs submitted in this competition, and their decision will be final.

The prizes offered are: First prize, cash $15.00; second prize, cash $10.00, third prize one year's subscription to the CANADIAN ARCHITECT AND BUILDER ARCHITECTS' EDITION.

The publishers of the CANADIAN ARCHITECT AND BUILDER reserve the right to publish any of the designs submitted and to withhold the prize if in the opinion of the jury the designs should not be found worthy of the awards.

Intending competitors are requested to read carefully the conditions of competition, and to strictly comply with the same in every particular.

The Bureau of Forestry of the United States intends to resume the work of testing timber. The Bureau aims at practical results, such as the values expressing the strength and stiffness of the principal species of timber.

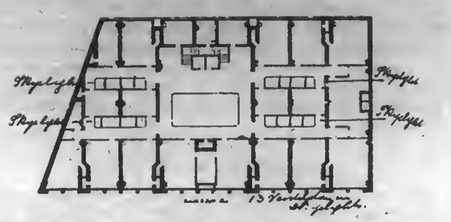
CORRESPONDENCE

VENTILATION OF OFFICE BUILDINGS.

WINNIPEG, MAN., Oct. 13, 1903.

To the Editor CANADIAN ARCHITECT AND BUILDER.

SIR,—I see that some sanitary authority has called attention to the bad ventilatinn in some of the sky scrapers of the larger American cities, although there have been large sums spent on



PLAN OF FOURTH AND FIFTH FLOOR, MCINTYRE BLOCK, WINNIPEG, MAN.

the mechanical ventilation of same. Judging by the experience I have had with the McIntyre Block illustrated herewith, large buildings can be well ventilated at reasonable cost and without any so-called mechanical ventilation appliances, the operative charges for which are somewhat heavy to say nothing of their first cost.

The McIntyre Block has a frontage on our principal street

MCINTYRE BLOCK, WINNIPEG, MAN.

here of 173½ feet, and the sketch with plans will give a fair idea as to size. Every suite of offices has a connection to one of the numerous ventilating chimneys or shafts in the fire walls, which are shown on sketch plans. I never was in a better ventilated building (either large or small) in my life, and if desired I can detail easily provable facts that bear out my assertion that the ventilation is really good. I don't wish to advertise the McIntyre Block or to bring my name into question, but would not a discussion in your journal on this matter be both interesting and instructive to your subscribers? The general construction of the McIntyre Block, apart from the ventilating shafts, may possibly have a good deal to do with the success I speak of. Trusting the above may be of interest.

Yours truly,
WM. LITCHFIELD.

HOLLOW BUILDING BLOCK CONSTRUCTION.

New York, November 6th, 1903.

To the Editor CANADIAN ARCHITECT AND BUILDER:

SIR,—Some time during 1902, we were very much interested in an article, which appeared in your columns under the caption "Tests of strength of hollow building blocks" in which you suggested their use for outer wall construction; enumerating the advantages possessed by them for that purpose as principally: the saving of weight, of great importance, especially where the material must be sent great distance; this saving of weight of further importance as it lessens the load on the foundations;—the air spaces insure a drier wall and greater rapidity in laying.

Your article closes "It would therefore appear in general that hollow blocks should furnish a wall amply strong for the circumstances under which they are commonly used."

It might interest your readers to learn that the idea is no longer in the experimental stage, but has proven to be highly practical: and the advantages you suggested as being possessed by the hollow blocks for wall building, fully demonstrated in actual operations.

Making the blocks of hard burnt terra cotta, 4"x8"x12" and weighing 16 lbs. each, by the addition of band-iron between the courses, we have constructed walls 350 feet x 200 feet and 24 feet 6 inches high, of a tank house for the American Smelting & Refining Co. at Perth-Amboy only 4" thick, which were computed by their engineers as being equal in solidity to walls of common brick 12" thick; while saving in weight some 800 tons, a matter as you state of the greatest importance where the material must be sent any distance; and a further saving of fully 33 1-3 % in cost, taking price for common brick as $5.75 per thousand, a very low estimate.

We are under contracts with the Barber Asphalt Paving Co. to erect several buildings with this wall, for their new plant at Maurer, N. J., some of which being completed, we are enabled

to give in greater detail the actual cost per square yard.

Cost of a "Phœnix" wall 4 inches thick and 15 feet high.

MATERIALS.

One 6-inch upright I-beam, for every 15 feet of wall (one beam to every 25 sq. yards of wall) weighing 14¾ lbs. per foot ; 227¼ lbs. for 25 sq. yards, or 8.84 lbs. per sq. yard at $2.65 per 100 lbs.	$ 0.24
Band-iron (1-16 in. x 1 in. wide) laid on every course of blocks ; 350 feet of iron to every 25 sq. yards, or 14 feet per sq. yard weighing about 1¼ lbs. at $3.20 per 100 lbs.	.04
Portland cement for every 150 feet 1 barrel at. $ 2.50	
Sand, ½ cubic yard, $1.25 .63	
Cost per sq. yard	.19
"Phœnix" blocks (4x8x12 ins.) 9 sq. feet at 12 cts.	1.08
	$1.55

LABOR.

A mason will easily lay in 8 hours—150 sq. feet of these blocks, at 65 cents per hour $	5.20
Helper, 8 hours at 37½ cents per hour	3.00
Total for 150 sq. feet $	8.20
Cost per sq. yard for labor	.50
Cost per sq. yard of "Phœnix" wall $	2.05

The estimated weight of a wall of " Phœnix" construction (4x8x12) 4 in. thick, and one of common brick 12 in. thick, say 200 feet long by 15 feet high gives :—

4500 "Phœnix" blocks at 16 lbs. each	72,000 lbs.
I-beams	2,780 "
Band-iron	700 "
Total	75,480 "

The same wall of common brick 12" thick, would contain 3,000 cubic feet, which even at the exceedingly low estimate of 100 lbs. per cubic foot would give 300,000 lbs. for the weight of wall, including the mortar.

Yours very truly,
HENRY MAURER & SON.

EFFECTS OF CINDER CONCRETE ON IRON AND STEEL.

To the Editor, CANADIAN ARCHITECT AND BUILDER.

MONTREAL, Oct. 18, 1903.

SIR,—Enclosed please find copy of a photograph recently taken of some work done about ten years ago and which is a good illustration of what cinder concrete will do to iron and steel after a certain length of time.

This occurred in a building to which an extension is now being built, and cinder concrete (fortunately) was only used under a fireplace situated exactly where this wall was taken down to continue the extension now in course of construction. The place is still visible to any one who wishes to verify the facts.

Yours truly,
N. T. GAGNON,
Secretary Montreal Terra Cotta Lumber Co.

COPY OF PHOTOGRAPH SHOWING EFFECTS OF CINDER CONCRETE ON IRON AND STEEL AFTER 10 YEARS.
(A) Channel Beam. (B) Gas Pipe. (C) Cinder Concrete.

BUILDING CONDITIONS IN HAMILTON.

The following extract from a letter received from a Hamilton architect shows the unusual activity in building operations prevailing in that city this year: "There is more work on here than there are men to do it and the result is that work is dragging along very slowly, causing much complaint from clients and leading architects. Of late, on alteration work, I have not called for tenders, simply going to a few reliable men and getting the promise of the required workmen and then letting them go on with the work."

PRESERVING STONEWORK.

In a recent address at the Royal Academy in London Professor Church gave some valuable information regarding the use of baryta water for the preservation of frescoes and stonework against injurious atmospheric influences. Baryta water can be used with safety when twenty times stronger than lime water, and the sulphuric acid in London's atmosphere, though it destroys the lime in a fresco, forms in combination with baryta an insoluble and practically indestructible substance which preserves from harm the colors of the painting. Professor Church said that he had been using baryta with success in the Chapter House at Westminster, where the thirteenth-century stone-carving has practically been converted into gypsum by the action of the atmosphere. So bad was the state of this carving when Professor Church commenced his treatment that when touched portions would adhere to the fingers, and it was liable to be damaged even by the slightest touch with a feather brush. He thought, however, that the application of the baryta water had preserved the carvings from further deterioration.

NOTES.

The Royal Commission on monuments of Belgium, constituted in 1835, is charged with the preservation of ancient buildings. The Commission may schedule any building or monument, and the scheduled building cannot be touched without the consent of the Commission, even if it is in private ownership. In Belgium, as in France and Denmark, grants of public money are given for the purchase and preservation of ancient monuments, and the Belgian municipalities are very zealous in the same direction. In Bruges, we understand, the facades of all the houses belong to the municipality, so that their preservation is secured, and also congruity in the case of new buildings. No object of art may legally be alienated or removed from a Belgian church.

BY THE WAY.

The British people seem to have imbibed the craze for large exhibitions which has prevailed in the United States since the time of the World's Fair held in Chicago. It is now announced that an "International Exhibition" will be held in Manchester in 1905. I sympathize with the view expressed by some English journals, that these exhibitions have been overdone and that people have become tired of them. The term "international" as applied to most of them is a misnomer, as they are distinctly local in character.

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The New York courts have granted an injunction restraining the Allied Arts Company and the Tiffany Company from making any changes in the mural decorations painted for the King Edward Hotel, Toronto, by Wm. D. L. Dodge, a New York artist. It is understood that by direction of the architect a Canadian artist is now engaged in making alterations to these paintings. The opinion prevails here that the jurisdiction of the New York courts does not extend to Canada and cannot affect Canadian artists. With regard to this the architect is doubtless acting under legal advice.

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On one of the leading business thoroughfares of Chicago a crowd assembles every day, opposite a new sky scraper now in process of construction. Apart from the general interest excited by modern methods of placing materials in position at so great a height, the special object of curiosity is a man at a forge who heats the nuts used in rivetting together the steel framework. This man takes the red hot nuts out of the forge with a pair of tongs, and with a dextrous flip throws them up a couple of stories where they are caught by another workman stationed with a receptacle to receive them. So skilfully are the nuts thrown that the receiver has only to reach out a foot or two on either side to catch them. The swift passing through the air of the blazing nuts, like shooting stars, naturally attracts much attention from passers-by.

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The results of the attempt which has been made in New York to provide suitable accommodation for the poorer classes, is most encouraging and should stimulate action along similar lines in Toronto. Seven years ago the City and Suburban Homes Company was formed backed by a number of philanthropic capitalists. This company have built a number of carefully planned tenements for the wage earning classes. They have as tenants 360 separate families. They have issued capital stock to the amount of $1,707,250 and estimate the present value of their assets at $3,000,000. After declaring a dividend of 4 per cent. they have in hand a large sum as a sinking fund. The company's report to its shareholders shows that but small loss has been sustained from apartments becoming vacant, and that the unrecoverable arrears of rents amount to but $248.

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The lines are being very finely drawn between the various unions connected with the building trades. A short time ago a strike occurred on the King Edward Hotel, Toronto, arising out of a dispute between the plumbers and the electric wiremen as to who should put the electric wires though the ducts. More recently the contractors for a new warehouse building, in order to avoid a strike, were obliged to discharge two stonemasons who had been engaged in putting in position what is known as Roman stone, an artificial stone composed largely of cement. The bricklayers contended that this material was being substituted for terra cotta, that the latter material had always been put in place by bricklayers, and hence that to the bricklayers should belong the work of setting the new material. Rather round about reasoning this, but the kind of thing that the modern contractor has to put up with.

ARCHITECTURAL CLASSES IN TORONTO.

The joint committee of the Ontario Association of Architects, and the Toronto Architectural Eighteen Club has now completed arrangements for the classes to be held during the coming winter. On Wednesday, the 18th November, there will be resumed the class in design held in the rooms of the School of Art and Design, 165 King Street West. In this class there will be senior and junior sections, open to all draughtsmen and students, and those intending to join are reminded that it is most important to be present on the opening night as the problem will then be stated and preliminary instructions given. The services of an ex-pupil have been secured as instructor on behalf of the junior students while the work of the seniors is reviewed by the critics on three evenings of each week.

The mathematical classes conducted by Mr. H. A. Harkness, B.A., have already been started in the rooms of the O. A. A., 96 King Street West, and are well attended. On Monday evening, statics and strength of materials are taken up by the senior students and on Friday evenings, geometry, algebra and trigonometry by the juniors.

A fee of five dollars has been fixed covering tuition in either or both these courses and all students are invited to join. It is gratifying to those in charge to note the interest that has already been displayed and much good should be accomplished by this season's work.

METHOD OF DRYING OUT DAMP WALLS.

A writer in "L'Industrie" gives the following as a method which he has proved to be successful for drying out damp walls and humid surfaces :—Dissolve 5 lbs. of pure olein in 5 lbs. of benzine, and coat the damp surfaces with the mixture. This solution of oleic acid, owing to its great fluidity and the capillarity of the mortar, sinks deeply into the latter, and together with the hydrated lime in the mortar produces a formation of greasy lime which constitutes a waterproof coat. The proportions of the mixture can, of course, be modified according to circumstances; and, instead of benzine, other solvents of the nature of ether and benzol may be utilized. A variation of this method is the employment of other fatty or resinous acids instead of olein. The resinous acids form with the lime hydrate a resinate of lime which has the same waterproof properties as fat lime. Damp or newly-built walls thus coated may, after almost instantaneous evaporation of the liquid, be papered or painted. As in the case of walls in cellars or tunnels, this process can be also employed successfully to coat cement, terrazzo or mosaic work.

THE STYLES OF ARCHITECTURE AND STYLE IN ARCHITECTURE.

By Prof. Percy E. Nobbs.

Note By The Author:—These three short papers (1) Drawing and Architecture; (2) The Styles of Architecture; (3) Material and Design; are intended as an introduction to the study of Architecture for students assumed to possess no knowledge of the subject, and the themes are treated with regard to their bearing on study only. They were delivered at McGill University this September.

Having reached our second year as students of Applied Science at this most scientific of universities it is to be assumed that we all realize the mighty strides by which empirical knowledge has advanced during the last century and we have possibly imbibed the idea that the ancients have very little to teach us. That is a frequent effect on the mind of scientific pursuits and is one of the deplorable results of "much learning" in certain subjects. Before going a step further towards the study of art it is necessary to disabuse our minds of this prevailing modern spirit of self conceit. True we are immeasurably ahead of even our grandparents in all that concerns science but how do we stand towards the men of old time in art? Knowledge for its own sake or more often for the sake of the material power it carries with it does not minister to the sum total of humanity's requirements—a little sentiment still exists, thank Heaven! and its natural manifestation in art must still go on, though it has been nearly crowded out of our life by more material activities.

When we look back a few centuries whatever the condition of mankind might be in material power, in art we find he had attained a level to which the best of us to-day do not seriously attempt to aspire. Our best is puny stuff beside their best but that is no reason for sluggish contentment with our medium qualities.

Life generally in civilized countries was surrounded with objects of real beauty up to the beginning of the great and glorious XIX century, and in the early years of Queen Victoria's reign, the reign of ugliness in all things made by men, especially Englishmen, reached its height or rather its greatest depth. The fact that things generally were well designed in days of yore is sufficiently attested by the "craze" among cultivated persons for old furniture, old china, old plate, old anything.—Collectors are very prone to admire things merely because they are old and not infrequently understand no other standard of excellence. Still the contention that old things were generally beautifully designed and that people are again beginning to appreciate beauty in the surroundings of life is amply attested by the prices and profits of "the old curiosity shop."

Now if we go back not two hundred but two thousand years and more we find in Greece a skill and power in all the arts which no time or people has surpassed nor even equalled perhaps. The superlative excellence of the Hellens in their artistic activities (and in many more besides) has instituted a standard of perfection which, if never again reached, has at least inspired men to high attainment ever since and has directly influenced about half the artistic output of the civilization of which we are the heirs. We need only go as far as Notre Dame street for a striking case in point. The great hall of the Bank of Montreal could never have been conceived in its present shape had not the glorious Greek tradition been handed down through the centuries. In it we find the Greek spirit manifesting itself through the luxuriant American mind of to-day.

Perhaps enough has been said to convince us all that we are about to study a subject in which the men of old time are our masters, so that the fact is accepted provisionally just now before we touch on the styles of architecture that is all that is necessary. The whole proof will take a session, nay a lifetime of study and then not all be told.

A word before we touch upon the styles. This is controversial matter! The battle of the styles has raged well nigh a hundred years in England and the disintegrated state of English architecture is the result of the blows that have been dealt.

There is still a prevailing idea among such members of the public as take the trouble to have an idea at all, and among a great many architects, that architecture is a cut and dry exact science, having for its object, knowledge of certain ancient fashions of building with a view to their reproduction to-day when asked for. These fashions are "the styles" and criticism is supposed to be restricted to the question of how faithfully the fashion professed has been followed. The majority of people we meet imagine that a client who admires Francois I. buildings, can get from an architect for a certain pecuniary consideration a Francois I. design for a house, and that the house so prescribed will not only have the beautiful quality of Early French Renaissance work, but that it will be an example and should be called by that name. Or a client may select Greek Doric and order accordingly.

Now this heresy has flourished more among the English than with any other people, and "the battle of the styles" above referred to, has consisted in reviving about 50 different "styles," every architect of note bringing new battalions of ancient details to the war. However unsettling this struggle as far as national traditions are concerned, signs are not wanting that peace is in sight. The survival of the fittest is a law as true in art squabbles as in animal life.

It is an idle inquiry, whether in a building roofed in last year which bears a resemblance to many other buildings built when George II. reigned, (and manifested his "distaste for art and poetry,") has all its details and accessories done in the way the said monarch's subjects habitually did them or not. If the building was roofed in last year it must be Edwardian. No man is responsible for the date of his birth, far less a building.

We as students must study the styles in vogue since history began for a great many reasons, which we only fully appreciate after we have been at it some time. We must also use the words bandied about in common currency, and when we speak of a modern building as Bazantine, to distinguish it from another which we designate as Greek, we must bear in mind that these are superficial differences, and both are properly XX Century Canadian, and will be so described by the students of the XXXV. century, let us say, if steel construction proves as good as it's designers hope.

As Europeans in civilization, we are concerned only with two great kinds of architecture, Gothic and Classic. Saracenic and Indian are the manifestions of quite different branches of the human family. In each we shall find gradual developments leading at particular periods of great activity or special influences to the production of quantities of work of one character, usually confined to a geograpical area and a short period. By the styles we mean such types of work.

"What is the difference between Gothic and Classic?" a new arrival in a big London office once asked of an elder brother who had been there many years. "The one has cusps, the other hasn't," was the reply. The full humor of that innocent reply will, I hope, be manifest to us all before very long. Modern Gothic and Classic is apt as in that office to be a mere matter of detail; but in our studies we shall find that real live Gothic and Classic are distinguished by fundamental principles of design, deeper even than their differences of construction.

I once heard a lecturer on art, I cannot remember who define our work as a matter of arrangement. "All art, he said, is just arrangement." Suppose for instance, on leaving home, a man dines at a restaurant with a friend and decides to drink a lady's health in the best he can afford. "Waiter! Wine list, No. 730, whole one." There is no art either in doing it so, or relating it so. But how does Burns describe this very thing. "Gae bring to me a pint of wine, and fill it in a silver tassie, that I may drink afore I gae a service to my bonnie lassie."

Just so in Architecture it is merely a question of arrangement. The things we arrange are the common things of life, the windows, the doors, the chimneys, the church seatings the cathedral spires. What then are the styles? We must remember that there is an analogy between all the arts and it is very difficult to talk about any one except in terms of the others, so if we look at poetry, the greatest of all arts, we may find help. The poet also deals in plain ideas and by arrangement of them welds the mighty thoughts, or fashions "jewels six words long." But there is more; there is his metre which helps out the ideas (if he is worth a penny a line)—which holds the whole together in a form—metres as old as the hills; Why should he try invent new ones? Metres which change by degrees through the themes—the feelings that tune to. The styles are our metres—our grand old traditional and rythmic types of construction, learned from one nation by another even as the metres were, and always tuned to that nation's temperament before being passed on. The analogy is complete. Now just as some metres were made by no one in particular, but simply grew while others and these not always the best, were deliberately evolved by single genuises, so in our styles. Among the architects of the late Renaissance in Italy there flourished one Palladio of Vicenza, a mighty genius whose opportunities were not quite worthy of him. He gave to the classic forms so studied a refinement along with a dignified and large serenity, that his work became distinguished from that of all the others. He died and left a book. That book of drawings became the standard of taste in English work for nearly a century. The metre he evolved was not taken up elsewhere to any great extent.

In poetry every master uses his metre in his own especial way and it does not require a very deep knowledge of English verse to spot Shakespeare from others using a blank verse of 5 iambic feet. In architecture too every man puts something of himself into his work (even when most studiously imitating some forgotten master). This is style in the real true personal living sense. "Le style c'est l'homme" is a glorious old adage, and that most versatile theorizer on all that pertains to our trade, M. Viollet le Duc is never so happy as when dealing with this aspect of style.

No work of art was ever produced without this kind of style—it is if not the chief quality by which a work of art is to be judged at least a quality whose absence in an object is incompatible with that object being a work of art at all. Style in this sense is that stamp of individuality that makes a building partake at once of the soul of the man who conceived it and the people that reared it. English, French and Italian work is characterized by broad differences of national temperament, independent of the century or the outside influences. This is the main reason for the growth of the diverse styles in spite of the fact that the architects of most periods have gone back to former times for inspiration. The Romans copied the Greeks whose superior artistic powers they always acknowledged. The XV Century Italians deliberately imitated the Romans. The English later on followed the Italians and to-day some of us at least are trying to hold onto those same English XVII Century traditions. Yet Greek, Roman, Italian, English and Modern Classic work all have wide enough differences to entitle them to be named as separate styles and nothing will sharpen our senses to the beauties of what has been done or fit us better to solve our own modern problems with an absence of utter ugliness than the comparative study of the styles both in the narrow popular sense of mere metres or forms and in the grand sense of all that makes for character in work.

HOW TO MAKE A LAWN.

The lawns in the 69 acres comprising the agricultural section of the Louisiana Purchase Exhibition at St. Louis are exhibits, and they have been as carefully planned as any of the other show spots in the outdoor section. Already they are beautiful and each day adds to their attractiveness.

The conditions under which these lawns have attained so great a degree of perfection establish beyond question the fact that splendid lawns may be grown under the most discouraging conditions. All along the east side of the great Palace of Agriculture a few months ago was a mass of yellow, sticky clay. A ravine, 17 feet deep, was filled with clay brought from the top of a neighboring hill. This was smoothed, plowed and harrowed and a top dressing of good soil, nearly a foot thick, was spread over the clay. This was worked, pulverized and prepared for the seed.

The seed selected was blue grass and rye grass, mixed in equal parts. The rye grass was first in evidence, but it has done the work that was required of it and has passed away. The visitor will never know it existed, unless he makes inquiries and learns that the blue grass is indebted for much of its beauty to its less known brother, the rye grass. The rye grass peeps up in six or seven days and is a nurse crop for the blue grass. It grows taller and shields the blue grass from the sun. It is perennial, and as it is not permitted to go to seed on a well regulated lawn it dies out and leaves the blue grass alone on the field.

One can tell on an October morning in St. Louis why it is called "blue grass." Walk over the lawn early in the morning before the dew has disappeared. The rye grass is the taller, and with its spears covered with dew it has a vivid green color. The blue grass spears are nearer the ground and in the coating of dew each spear takes on a light blue, but an unmistakably blue color. The blue grass is exclusive, and wherever it takes a stand all weeds and other common grasses are crowded out.

But there are things about planting that Mr. Hadkinson, superintendent of outdoor planting, knew and did that had much to do with the success of the lawns. After getting the ground into proper trim the seed was sown, broadcast by hand, one pound to each one hundred square feet. The seed was covered with what he calls a "choppy" motion. A gardener goes over the lawn with a rake, and instead of raking and rubbing the seed in, he swings it slightly and allows the teeth to enter the soil about an inch. When the rake is lifted the soil is turned under for about half an inch. The pulverized soil must be treated to fasten the seed in the ground. On the comparatively level places, a heavy roller is used. On the terraces, and some of the terraces incline at an angle as great as 30 degrees, a "pounder" is used. This is a board a foot wide and a foot and a half long, fastened to a handle with blocks added until it weighs about 15 pounds. The surface is "tamped" with this.

When the earth is smoothed the final work is done. All summer long a great pile of stable manure had lain in a neglected heap in front of the garden. It was thoroughly decomposed. This was run through a soil pulverizer and after being granulated was sprinkled over the ground. The covering is slight, but is all that is needed. It keeps the sun from baking the soil and causes it to retain the moisture. No other fertilizer is used. Having done this, Mr. Hadkinson waited, and nature is doing the rest.

There is one pest that has demolished many a beautiful lawn, and the World's Fair landscape gardeners had a short bout with it before they succeeded in overcoming it. This pest is the mole. These little fellows with wonderfully powerful fore paws, and soft and glossy fur, burrow a few inches under the surface of the ground and raise ridges in the lawn. The moles feed on the earthworms and harm the roots of the grass only incidentally. But if the moles are not killed they will destroy the lawn. Traps are freely advertised but seldom prove effective.

Mr. Hadkinson's foreman is a fearful foe to the mole. He watched Mr. Mole and studied him. The mole takes his meals regularly, at 6 a.m., noon, and at 6 p.m., and at any of these hours is the time to catch him.

The ridges made by the mole must be beaten down, and watched. When the mole goes over the route again the ridge is again raised. Then the process is easy. Take a spade, drive it in the ground across the moles' route and behind him. Unless this is done he will skurry underground and find safety in one of the deep holes that he has provided for emergencies. But the spade stops his progress and he may be easily dug out and dispatched. In less than a month the moles were banished from the agricultural section of the Fair.

PUBLICATIONS.

"How to Judge Architecture," is the title of a new work by Russell Sturgis, A. M., Ph. D., the well-known architect. The Baker & Taylor Co., Union Square, New York, are the publishers. The book consists of 215 pages, including 84 illustrations of celebrated buildings. It aims to be a popular guide to the appreciation of buildings. In the opening chapter, the author says: "The reader must feel assured that there are no authorities at all in the matter of architectural appreciation; and that the only opinions or impressions, or comparative appreciations that are worth anything to him are those which he will form gradually for himself. He will form them slowly, if he be wise; indeed, if he have the gift of artistic appreciation at all, he will soon learn to form them slowly. He will, moreover, hold them lightly even when formed, remembering that in a subject on which opinions differ so very widely at any one time, and have differed so much more widely if one epoch be compared with another, there can be no such thing as a final judgment."

ARCHITECTURAL LEAGUE OF AMERICA.

The annual convention of the Architecural League of America was held last month in the rooms of the St. Louis Architectural Club. J. P. Hynes of Toronto was elected the Speaker of the convention and J. B. Nettleton of Detroit, Secretary.

Reports were heard from the Executive Board, F. S. Lamb of New York, Chairman; from the Treasurer, Julius F. Harder, of New York; from the Committee on Publicity and Promotion, E. J. Russell, of St. Louis; from the Committee on Codes of Ethics and Competition, Julius F. Harder, of New York; from the Committee on Current Club Work, Chas. O. Pfeil, of Memphis, Tenn.; and from the Committee on Exhibition Circuit, the Committee on Education, and the Committee on Publicity and Promotion. A special report of the Committee on Civic Alliance was also read. This contemplates making the A. L. A. a member of an alliance of all the important civic and artistic organizations of the country.

A letter was read from the authorities at Washington, inviting the Architectural League of America to send delegates to the International Convention at Madrid: delegates were duly appointed.

The delegates then visited the Louisiana Purchase Exposition, took luncheon at the Administration Building, and were received by Mayor Wells, of St. Louis.

An address was then made by Mr. Isaac S. Taylor, Director of Works.

The Exposition Grounds were inspected by the delegates in the afternoon.

On Monday evening a public meeting was held in the Museum of Fine Arts. The exercises were opened with an address by Prof. Halsey C. Ives, Director of the Museum of Fine Arts. Then followed three papers on the "New Thought in Design", the opening paper, by Frederick S. Lamb, of New York, President of the A. L. A.; "The Influence of the Movement Upon Ornamentation;" by Mr. Claude Fayette Bragdon, of Rochester, N.Y.; "Its Effect Upon Construction;" and Mr. Hugh G. M. Garden, of Chicago, gave the concluding paper, "The Effect of Both Upon Architecture."

Tuesday morning was occupied by a business session of the convention at the rooms of the St. Louis Architectural Club; luncheon was then served at the Union Station Cafe, and in the afternoon the official business of the convention was concluded; the new president elected; and the place at which the next annual convention is to be held, decided upon.

In the evening there was a review of the parade of the Veiled Prophet from a stand in front of the Carleton Building; and before leaving the delegates were entertained at a symposium held in the banquet hall of the St. Nicholas Hotel.

The Executive for the ensuing year is composed as follows: Ernest Helfensteller, Jr., President; John C. Stephens, 1st Vice President; Wm. B. Ittner, 2nd Vice President; N. O. Vegley, Treasurer; W. T. Trueblood, Secretary; Prof. F. M. Mann, E. C. Klipstein, Ernest Helfensteller, Jr., John C. Stephens, Chas. O. Pfeil, Ernest J. Russell, Oscar Enders, E. G. Garden.

It was determined to hold the next convention at Pittsburg, in the months of April or May, next.

A vote of thanks was extended to the retiring President, Mr. F. S. Lamb, and to the Executive Committee.

A vote of appreciation of the courtesies extended by the Louisiana Purchase Exposition Company to the A. L. A. was also passed.

The thanks of the visiting delegates was expressed in proper form to the St. Louis Architectural Club, and particularly to its President, Mr. Ernest Helfensteller, Jr., for the able and hospitable way in which they carried out the task imposed upon them.

ONTARIO ASSOCIATION OF ARCHITECTS.

At the meeting of the Toronto Chapter held on the 3rd inst. the following resolution was adopted: Moved by W. L. Symons, seconded by G. W. Gouinlock: That the Toronto Chapter of the Ontario Association of Architects views with great satisfaction the acquisition of the Garrison property by the City of Toronto for the purpose of a park, and heartily endorse the proposal to employ an expert or experts to suggest a scheme for laying out the same in a proper manner, in connection with the development of a general system of parks, drives, street improvements and playgrounds. Numerous instances could be cited of the success of such method of procedure. Among the latest may be mentioned the City of Ottawa, and the City of Cleveland, Ohio. In the case of the latter city, some $20,000 has been expended in the preparation of a report and design for a most artistic scheme on generous lines, by three of the ablest experts obtainable, and the result, when carried out in its entirety, bids fair to be most successful, amply warranting the initial expense incurred. There is no reason why Toronto should not, in the course of time, have one of the most unique and attractive systems of parks and drives on this continent. The present is an opportune time to begin this development, and only by judicious forethought in the planning of the scheme can satisfactory results be accomplished. A scheme should be matured now even though it should take half a century for its final and full development.

Preparations are now in progress for the annual convention, which will be held on Tuesday and Wednesday, January 12th and 13th. The prospects are that it will be a most successful one. A special feature will be the exhibition to be opened in the rooms of the Association, on the first evening of the convention and to be continued for one or two weeks. Following the trend of popular feeling, the motto is to be "Made in Canada" and there is expected to be on view a thoroughly representative collection of drawings, water colors, photographs, decorative designs and sculpture, illustrative of Canadian architecture and art. Architects from all parts of the province should endeavor to make this exhibition a success, and it is hoped that in many cases special drawings will be prepared for the purpose. The committee in charge of the convention is now making arrangements for the programme, which should be appreciated by the members at large. A fitting conclusion to the convention will be the banquet to be held in the King Edward Hotel.

The members of the Toronto Chapter have made a new departure this year, as regards the Tuesday luncheons. They have joined with the members of the Engineers' Club, holding a combined luncheon, with the result of double the attendance and much good fellowship. If any special business affecting either branch demands attention, a withdrawal is made to the club rooms, after the luncheon.

THE TORONTO ISOLATION HOSPITAL.

To the Editor of the CANADIAN ARCHITECT AND BUILDER:

SIR,—I would respectfully call your attention to the new addition to Isolation Hospital now being erected. The addition is placed between the jail wall and south wing of old hospital—10 feet from latter and about 15 feet from former. The shed and yard where prisoners work is just under the hospital windows, while the women's work rooms are only a few yards farther away. The jail hospital and ward windows are in close proximity to the new addition, which is to be provided with a cold air fan to remove all contaminated air—blowing it out on a level with jail windows, so that it may not linger on the way and may be received fresh.

It is surely a disgrace to civilization to have this sort of return to the historical ghettos of ancient history, and will if possible make the hospital more of a contagious imparting center than it has been—where so many have come in with one disease and got another before they left—owing to interference with original plans of architect and want of realizing that an hospital for contagious diseases ought to be worked on different plans from those for the treatment of non-contagious diseases.

The law requires an hospital of this kind to be placed 150 yards from any dwelling, and the old hospital was burned down because it was only 140 yards from one dwelling. The new one is not 100 feet from hundreds of people, and guards and prisoners have to work and pass within a few feet of its windows. We have heard it proclaimed that 9 miles of still water in our deep lake is not enough to purify it. Now here is a case where as many feet of air is supposed to purify it. What is the given data for each?

I have said nothing of the blanketing of windows between new and old, with exclusion of light and air, and consequent harbouring of bacteria. I have said enough to show how careless some authorities can be.

Yours respectfully,
PLUMB RULE.

[EDITOR'S NOTE.—We have investigated the statements made by the writer of the above letter, and find that at least some of them are incorrect, and that there are special circumstances which ought to be stated. While the Ontario Health Act provides that a hospital for contagious diseases must be situated 150 yards from any dwelling, the Ontario Legislature granted a special Act permitting the placing of the original Toronto Isolation Hospital, as well as the new building now being erected, on the site which they occupy. As the Provincial Government are the owners of the jail property, it must be concluded that they did not consider that the inmates or officials of the jail would be likely to be affected by the proximity of the hospital buildings. The jail yards proper are sufficiently far away to almost prevent the possibility of infection reaching them through the open air space intervening. It is learned that it is the intention of the hospital authorities to ventilate the new building entirely by means of fans, and to keep closed at all times the windows facing the jail yards. The statement that the foul air from the hospita will be blown out on a level with the windows of the jail is hardly correct. The air will be drawn by suction fans into a ventilator and by fans will be driven vertically out of the ventilator at the top of the building at a height of 50 feet. This ventilator is sufficiently distant from the jail building to make it certain that the air thus discharged under pressure will be dissipated into the atmosphere instead of finding its way into the jail windows.]

The report of the Building Inspector of St. John, N.B., shows that thus far sixty seven building permits have been issued this year, and that in quality as well as quantity building improvements have surpassed those of any recent year.

Bids were opened for a school house in Indianapolis the other day, and the cost was $14,000 more than there was money to build with. Buildings in neighboring towns have overrun the estimates from 30 per cent. to 100 per cent. This is owing to two causes: First, an absolute increase in the cost of material and labor; second, an uncertainty as to the course of the market for material and labor. Strikes and rumors of strikes leave us at sea as to the future. The builder is not really disposed to take the short end of it.—The Clay Worker.

The Eiffel Tower in Paris, the removal of which at an early date was referred to in a previous issue, is 986 ft. high. In its construction were used 7,000 tons of iron, 2,500,000 rivets, weighing 450 tons, and 12,000 working drawings. The legs measure about 250 ft. at the base, while the platform at the top is 53 ft. square. The total thrust on the foundations is 565 tons, not including wind-pressure; under a maximum wind-pressure the thrust is 875 tons. The structure cost $1,000,000, of which sum the State contributed 60 per cent. the remainder being supplied by Mr. Eiffel, who has received for twenty years the profits from valuable concessions.

NOTES

The legislature of Oregon has passed a bill requiring the appointment of a board of examiners of plumbers in every incorporated city of 4,000 population.

A public subscription is about to be opened in Toronto for the purpose of erecting a monument to the memory of Toronto soldiers who fell in the South African war.

Mr. E. J. Lennox, architect of the new municipal buildings in Toronto, announces that the total extras on the buildings will not exceed $15,000. This must be considered a very satisfactory showing when it is remembered that the buildings cost upwards of $2,000,000, involving eighty separate contracts.

Ald. Curry, who is an architect, is urging the City Council of Toronto to adopt a number of amendments to the present method of assessment for local improvements. One is that suggested by this journal last year, viz., the placing of a special tax on the owners of vehicles. The owners of delivery wagons are chiefly responsible for the wearing out of the pavements and are most benefitted by good pavements, by means of which the cost of renewal of both vehicles and horses is greatly lessened. These are the people therefore, who should contribute most largely to the cost of good pavements.

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Prices for advertisements sent promptly on application. Orders for advertisements should reach the office of publication not later than the 12th, and changes of advertisements not later than the 5th day of the month.

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Contributions of value to the persons in whose interest this journal is published are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

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BUSINESS NOTES.

A representative of this journal had the opportunity recently of inspecting the new factory of the Canadian Heating and Ventilating Co. at Owen Sound, Ont. The company commenced to build on the first of June last, and now occupy the completed building, a substantial stone structure, with modern equipment for the manufacture of furnaces, radiators, stoves and ranges. The management of the company, which is capitalized at $200,000, is in the hands of Mr. J. Christie.

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MOVING CARRARA MARBLE.

The marble quarries of Carrara, Italy, number about four hundred and give employment to nearly seven thousand men. Hard labor is the rule, for the distances separating quarry from quarry and the declivitous nature of the country make the use of machinery almost impossible. Hence, say a writer in Pearson's Magazine, have grown up the methods of the lizzatura, or workmen, who convey the marble over the roadless steeps that stretch from the quarries to the wagon track.

As soon as a great fragment of marble, detached by a blast, has stoped rolling, it is roughly squared into a block weighing, say, forty tons. Then the lizzatura set about getting it down.

Along certain lines of descent offering the least resistance a succession of stout posts has been firmly driven into the mountain side. The men, by means of crowbars and screwjacks, raise the block on to a soaped skid of beechwood. Before doing this they secure the block by means of three long kempen cables, with which they take turns around the posts. They pay out sufficient rope to allow the ponderous mass to slide over the soaped skids by its own weight, but not enough to allow it to gain too much momentum down the incline.

During the descent, besides the men tailing on to the ropes, two or more men are seated on the block. A man following closely on the wake of it hands them the skid just passed over, which they resoap and hand to a man who keeps just in front of the moving mass, to put down in its path, and so provide a continuous slipway. This last-mentioned worker has the most perilous task. If one of the cables parts at a critical moment, or if a mistake has been made in paying out or slackening them, he must inevitable be crushed.

It is an amazing fact that in former times the lizzatura used only one cable to hold back the load, until the government, rightly regarding their's as a dangerous occupation, passed a law that not less than three cables should be employed. On an average, this work is responsible for three deaths a year, but for the most part the finest discernment, judgment, coolness and skill are displayed by the lizzatura, who work in gangs numbering twelve to fifteen men.

It is really astounding to see how these workmen handle the huge masses of marble, without machinery of any kind but crowbars and jackscrews. Pieces of forty tons' weight, with those simple implements, are loaded on bullock wagons and carried down to Carrara all the way by road—a terribly toilsome process, for the mountain road is more like a bed of a torrent than a beaten track.

NOTES.

Up to the first of October the value of new buildings erected this year in Vancouver, B.C., as represented by the building permits is $1,300,000. The total for the year is expected to reach a million and a half.

Interest has been aroused by the announcement, as the result of a prolonged series of experiments, of a method of so treating timber as to secure even from soft wood a largely increased toughness and hardness. The process is described as one of vulcanizing, comparable in some respects with Bessemer's process for converting iron into steel, and is the invention of Mr. Powell a Liverpool merchant. The treatment to which the timber is subjected is, roughly speaking, that of saturation at boiling point with a solution of sugar, the water being afterward evaporated at a high temperature. The result is to leave the pores and interstices of the wood filled in with solid matter, and the timber vulcanized, preserved and seasoned. The nature of moderately soft wood, it is claimed, is in this way changed to a tough and hard substance, without brittleness, and also without any tendency to split or crack. It is also rendered remarkably impervious to water. Hardwood similarly treated derives similar benefits. Moreover, it is claimed that the process may be completed and timber turned out ready for use in a few days.

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CANADIAN ARCHITECT AND BUILDER
NOVEMBER, 1903

The Canadian Architect and Builder

VOL. XVI.—No. 192. DECEMBER, 1903.

ILLUSTRATIONS ON SHEETS.

Proposed Addition to Grace Hospital, Toronto.—Beaumont Jarvis, Architect.
Offices Toronto and Niagara Power Company in Victoria Park, Niagara Falls, Ont.—Bond & Smith, Architects.
Competitive Design for Vancouver Hospital—John J. Honeyman, Architect.
Office Building for J. J. Riley & Sons, Montreal.—Finley & Spence, Architects.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Drawings Accompanying Notes of Travel.
Entrance and Interior View of Rylands Library, Manchester, Eng. (Illustrating Article by Mr. W. A. Langton, in this Number.).

ILLUSTRATIONS IN TEXT.

Plans of Bread Factory, at Hamilton, Ont.— J. F. Rastrick & Sons, Architects.

CONTENTS

Editorial	191-192	The Ontario Association of Architects	202
Notes of Travel	193	Heights of Famous Buildings	202
Illustrations	194	Foreign Recognition of Canadian Skill	202
Toronto Master Plumbers' Association	195	Ventilating Systems	202
Tests of Masonry Piers	196	Northwest Letter	203
Radiation or Pipe Surface Required for Buildings, Having Considerable Variations in Construction, Size and Temperature	198	A Suggestion	204
		Tested Fireproofing	204
By the Way	199	A Round Square	ix
Plans for a Grand Stand	199	Raising a Chimney Stack	ix
Material and Technique in Design	200-201	Mineral Production of Newfoundland	x
		Legal	xi

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Our Students' Competition.

Architects will confer a favor by directing the attention of their students to our Students' Competition, particulars of which are printed in this number. Every industrious and ambitious student should find it profitable to take part in this competition.

Giving Value to Waste Material.

A few years ago brickmakers in Toronto threw away as useless a considerable quantity of what are known as "clinker bricks," i. e., bricks uneven in color and shape and exhibiting protuberances on their surfaces. These peculiarities are due to the bricks being placed in the arch of the kiln where they are exposed to the greatest heat. An architect in looking one day at a pile of these refuse bricks thought he saw possibilities in them, and forthwith bought sufficient of them to build himself a house. The appearance of the house was pleasing and in contrast to the ordinary run of work. Other architects then saw a value in the clinker brick and began to use them. The demand so increased that the brickmakers themselves came to see the value of what they had been accustomed to regard as a waste product and the price was advanced until now "clinkers" bring two dollars per thousand more than standard first quality.

Arbitration of Building Disputes.

The Building Trades Council of Toronto have applied to the Ontario Association of Architects to have a clause inserted in all contracts providing that any disputes which might arise between contractors and workmen must be settled by arbitration. At the last meeting of the Toronto Chapter this request was fully discussed, after which a resolution was passed declaring that while the architects were heartily in favor of the principle of settling disputes by arbitration they could not advocate the insertion of an arbitration clause in contracts so long as the Building Trades Council or its component unions could not be held legally responsible for any agreement into which they might enter.

Fixing Responsibility.

Where a number of contractors representing various trades are engaged on a building, an effort is made to shift responsibility for any neglect or damage from one to another. Under these conditions the architect, who of course cannot be constantly on the work, experiences great difficulty in placing the responsibility on the proper shoulders. He has sometimes to spend much time and effort to get the contractors together in order that the difficulty

may be threshed out and if possible the blame put where it should belong. Even when a meeting is secured, the object is not being attained, and the guilty party goes free. Some architects have to a large extent got over this difficulty by including the roofing and tinners' work in the carpenters' contract. Some are now considering the advisability of making the roofer responsible for any damage which may be sustained by the carpenter or plasterer by reason of leaks in the roof.

The Value of Simplicity.

"The older I grow the greater is my admiration for simple things," said an architect of conspicuous ability to the writer recently. He added that as a rule people now-a-days do not want simple things. All sense of repose is destroyed by crowding modern houses full of ingle nooks, bow windows, fire places, &c. As a result there remained no wall surface, no place to put anything; "You can't sit on the fireplace, you know" he remarked, and characterized as "rot" the idea that a modern house should have a Turkish room, a Japanese room, etc. On the contrary the house throughout should have one character. Much of the recent architecture in the United States has actually been spoiled by the fact that the architects had too much money at their disposal, and therefore were not compelled to exercise restraint in their designs. That the public taste has been perverted is illustrated by the remark of a prominent citizen of Toronto, when referring to the new residence ot another wealthy citizen, the exterior of which is characterized by simplicity of design, that he did not want HIS new house to look like a barn.

Up-to-Date Building Methods.

Swiftness is a predominating charactistic of this age. Every device that will save time and labor is eagerly sought for and when found is quickly adopted by progressive business firms. Sometimes we think that many things of perhaps greater importance are sacrificed to speed. However this may be, it is undoubtedly true that when the majority are aiming at accomplishing their work with the greatest possible despatch, the man or firm who pursues a leisurely gait, is likely to be left behind in the race. It is therefore gratifying to observe the builders falling into line with other departments of industry by adopting modern business methods. One of these is the placing of a telephone on the job, so that constant communication may be had by the foreman with the offices of the architect, the contractors and supply firms, and vice versa. The value of the time which may thus be saved is considerably more than the cost of the telephone service. Wide-awake builders are coming to recognize that by adopting every possible time saving device they may add considerably to their profits and be able to underbid the contractor who still pursues old fashioned and out-of-date methods.

Asbestos in Building

It is interesting to learn that the product of the asbestos quarries in the province of Quebec is in France being manufactured into bricks, roofing slabs and outside and inside lining material for buildings. At an Exhibition of dwelling houses held in Paris in August last, a model was shown of a modern house built entirely of asbestos bricks, which are claimed the advantage of being absolutely incombustible and unattackable by acids, while at the same time bad conductors of sound, heat, cold and electricity. They are composed entirely of asbestos, lime, and silica in strictly defined proportions, and the substances intimately mixed by special machines, are compressed in the form of ordinary bricks by powerful presses. The bricks are afterwards subjected to the chemical action of high pressure steam, owing to which a double silicate of lime and magnesia is formed. These new building materials, the structure of which is perfectly homogeneous, are said to be equal to the best clay bricks as regards resistance to crushing stress. They are easily cut with the trowel, and take mortar well, while the thickness of joint is reduced to a minimum owing to the perfectly regular form of the brick. The external appearance is that of dressed stone ; and, as the bricks can be colored unalterably while in the state of paste, they lend themselves admirably to polychrome decoration.

British Exports and Imports of Building Material.

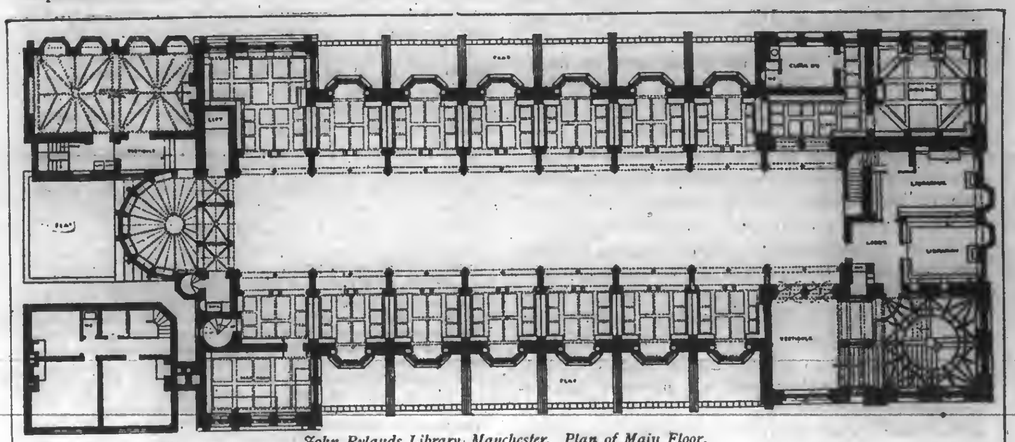
The Board of Trade have recently published a blue book, from which some particulars are extracted relative to this subject. One of the most startling facts disclosed from the British standpoint is the tremendous drop in the exports of cement; shipments to the United States in 1902 being only one fifteenth as great as in 1901 and to other foreign countries, about one sixth. While the exports to the colonies are reported to have been regular, it is a well known fact that the Canadian market has been largely supplied by home manufacturers and by the product of United States mills, while in 1901 Australia, Natal and the Cape are said to have purchased from foreign manufacturers to the value of £20,000. The shipments of bricks to the colonies increased by one half from 1892 to 1902. Very little if any of this material found a market in Canada, as our manufacturing resources in this line are ample. In painters' materials the exports both to foreign countries and to the colonies substantially increased. Increased quantities of manufactured articles of iron and steel were also sold in the colonies; as well as stones and slates. The foothold which foreign manufacturers ot iron and steel are getting in the British market is shown by the import figures. The quantities ot bar, angle, bolt and rod iron, unwrought iron and steel, iron and steel girders, beams, joists and pillars imported into Great Britain from Germany, Holland and Belguim increased from 99,942 tons in 1899 to 529,970 tons in 1902. The value of these imports increased during this period from £667,528 to £2,810,723. The imports from the United States increased from 71,608 tons in 1899 to 172,105 tons in 1900, but, owing to the extraordinarg home demand has felln in 1902 to 3,853 tons. The present slackening of this demand will no doubt lead to another vigorous assult on the British market. These statistics are now being very carefully dissected and considered by the Journals representing the various branches of trade in Great Britain, in the light of Mr. Chamberlain's preferential tariff campaign. Viewed from this standpoint they should also have an interest and a meaning for Canadians.

NOTES OF TRAVEL.—VII.

The John Rylands Library, Manchester.

If this is not the most interesting recent building in England, one would like to see the building which is of greater interest. Mr. Basil Champneys, the architect, appears to have had a pretty free hand in the matter of both expense and time, (the library was nine years in building), and, though a definite lead was given which suggested the style, it was a style which suited the designer and he has worked quite freely in it. It is gothic; but English gothic, which still seems quite at home in England, when properly handled. The plan is rather suggestive of a church plan and the style is early, yet the building has a thoroughly modern air ; there is no archaic feeling about it.

The Library is rather a repository for rare books than a place for distributing current literature. Its strength is in early printed books, an "unrivalled collection"; a collection of Aldines, "believed to be the finest in existence"; a Bible collection comprising, besides some MSS., copies of the successive printed editions; in first editions of the classics of English literature; early maps and atlases; the Early Fathers; early Service Books; in fact in books which are the fountains of study in their various fields and are consulted only by scholars. For this purpose the building is perfect.



John Rylands Library, Manchester. Plan of Main Floor.

The plan of the main floor (taken from THE BUILDER) which is shown here, shows the distinctive feature of the building in the way in which the body of the great Reading Room is recessed. The building is free on both sides, lying between two narrow streets ; but ancient lights in the premises across these streets; and the need of abundant light in the reading room, required it to be set back about 12 ft. from the building line of the sides. The ground floor rooms are kept in the centre also; they are approached by vaulted corridors along the sides, (the roofs of which appear in the plan), which are kept down to 9 feet in internal height, so that there is space (some 10 feet) above them for lighting the ground floor rooms. These rooms are a lecture room—close to the entrance—committee rooms, and minor rooms for storage of books and for reading. The ground floor is one flight of steps above the entrance, which has a level of its own near the level of the street. The entrance, which takes the whole space under the Librarian's rooms in the plan, was intended to be imposing, but has failed because the stairs are not visible on sight and are in a chamber which is too close and contributes but little light to the entrance. If the stairs were open, and the light came from there, it would have been a fine entrance hall; as it is it is only a vestibule, large but gloomy. There is no hall.

The main floor, which is both reading room and book room, is shown in the plan and a photographic view is given in the illustration sheets. The books are contained in alcoves. There are two tiers of alcoves, each with a bay window filled with square leading of a delicately tinted whitish green glass, with a bull's-eye in every quarry. The upper alcoves are reached by a narrow stone gallery which makes below a sort of columned and vaulted vestibule or screen to the alcoves on the main floor. This gallery runs all round; the piers, or buttresses, which carry the vaulting, are pierced with openings for its passage. There is no continuous wall; the two stories of bay windows dispose of the continuity of the outer wall; the vaulting is carried on piers, about 2 ft. 3 in. by 6 ft., which are stayed by the gallery, by the arches and vaulted roof of the upper alcove, (which is itself buttressed between the bay windows), and by arches turned between the piers themselves, over the clear story windows. The alcoves are not divided by walls but arched openings filled by bookcases; and the floor between the two tiers, inside of the gallery, is of wood. The two tiers of alcoves are only 30 feet high and the main vaulting is 44, so that there is room for a large clear story window. No space is occupied by a wooden roof for there is none over either aisles or nave; the stone vaulting is finished to a level with concrete and covered with asphalt. There is no point of view from which the roof can be seen, except perhaps in front; and a pair of towers, with, I believe, a parapet wall between, obstruct any view from this point. There is something unusual also in the position of these towers. They are not set over the outermost area of the double squares, which flank the entrance on both sides, but over the inner square of each; the outer square in each case is a lantern, nestling, as it were, at the base of the tower, (an odd-looking arrangement,) and lighting in one case the staircase and in the other (apparently) the Bible Room. The towers have no internal signifi-

cance. The explanation of their being set back in this way is the necessity of fitting the profile of the building to the angle required by rights of light on the opposite side of the way. The space between the towers, occupied by the Librarian's rooms, is roofed over at the gallery level; so that there is a large window, rising from the gallery to the apex of the vaulting, at this end as well as at the other.

To return to the interior of the Library proper which is the essential part of the building—the central portion of this hall, the nave as it were, is 20 feet wide 44 feet high and 125 feet long to the terminating window, or 148 feet long, counting in the apse, which exends the floor level but not the roof, as it is vaulted over to a lantern about the height of the gallery. In the same manner the alcoves extend the width another 20 feet on each side, counting in the projection of the bay windows. The actual sitting space in the alcoves omitting the bay windows (6 ft. wide by 4 ft. 8in. projection), and the vestibule formed by the colonnade carrying the gallery, is 10 ft. by 12 ft. inside of the bookcases.

The bay windows of the alcoves are panelled in oak, (linen pattern) and the ceilings of the lower alcoves are beams and plaster, but this is the only wood that appears in the construction; all roofs are vaulted in stone and the tracery of the large windows is stone. The building is essentially stone and appears to be all stone. The colour of the stone which is both well chosen and well handled, is therefore a great part of the beauty of the room. The stone used for the interior is Shawk, a stone that varies in colour from grey to a delicate tone of red. In the earlier part of the building operations it was procured with the varied tints closely mingled, so as to give the stone a mottled appearance; but this gave out in time; the colour seems to have then appeared in larger masses in the quarry, so that the stone delivered was no longer mottled but in pieces of homogeneous colour, varying however from one another to the extent of the opposite poles of the colour exhibited in the quarry. The bold juxtaposition of lightest tint and darkest tint in the use of the stone, after it came in this way, is satisfactory from every point of view; it relieves the building as a whole from monotony of colour, and, as a matter of closer inspection, it brings out the jointing, always a great part of the beauty of stonework. If the accompanying illustrattion of one of the alcoves reproduces correctlv the variation of tint in the stones, (which is even more delicate in the photograph than it is in reality, but it must be remembered that the colours are delicate) this will be seen. In the vaulting a banded effect was made, which also seems constructionally suitable there.

The statues, which stand on an attached column in the centre of each bay of the gallery, are of the same stone. They are portraits of eminent men of different countries and ages, in the several departments of Literature, Science and Art. The same idea is carried into the large windows at each end, which have each twenty portraits of intellectual lights, ranging from Moses to Thomas Carlyle. These are the only stained windows in the building, and in these it is only the figures that are stained. All other windows are leaded in squares, glazed with the most delicately tinted, whitish green glass, with a bull's eye in each quarry.

As to fittings:—The most noteworthy are the dust-tight doors of the bookcases. These are made of gunmetal, about an inch square, and carry a sheet of plate glass 2 ft. by 9 ft. 9 in., without crossbars; there can be none because, the shelves being set to varying heights it would be impossible to make the sash bars range with them always. The exclusion of air (i.e. dust) was perfected by insertion under a fillet, of rolls of velvet made elastic by the insertion of cotton wool. It appears, however, that the absolute exclusion of air, which doubtless means the prevention of change of air, is not good for the books. Air is filtered by means of cotton wool, as it enters the building, and arrangements have been made for the application of water sprays, if they are found necessary. Gas is absolutely excluded, the reason given—that it "takes all the moisture out of the air and forces off the backs of the books in an extraordinary way"—is worth noting for application in another direction; heating arrangements that take all the moisture out of the air must have provision, in a library for putting it back again. The fact is that the best way to make the air of a library suitable for books is to see that it is suitable for human beings; the best conditions for health seem to be the same for both the librarian and his books.

W. A. Langton.

ILLUSTRATIONS.

Referring to the competitive design for Vancouver General Hospital by John J. Honeyman, reproduced in the illustration pages of this number, a word may be said regarding the plan:

The three rear ward pavilions have open arcarded basements to allow of air movement between the buildings. While the plan shows the disposition of the main buildings, a block plan of the whole site (606'x400') would show in the rear a mortuary, isolation ward, nurses' home and steam laundry, with dynamo, heating plant, etc., disposed with driveways and approaches complete. The front facade as shown faces due north and has a commanding view of the whole of Vancouver, on the north side of False Creek Inlet.

OFFICE BUILDING FOR MESSRS. J. J. RILEY & SONS, ST. JOHN STREET, MONTREAL. —FINLEY & SPENCE, ARCHITECTS.

The building is designed in the Old Colonial style, and the front elevation is carried out in white marble and Roman brick; being the first example of this style of work in Montreal. The frontage of the building is forty-six feet. The building has been designed especially to suit the needs of the owners, the main entrance leads directly from the street to the ground floor, which forms a large public office fifty feet deep by forty feet wide, with the private offices of the firm to the left of the main entrance.

The first floor of the building forms a wide gallery which is carried around all sides of the building leaving a large area twenty feet square with a sky-light of the same size in the roof. As the only side lights to the building are the windows in the front elevation, this skylight gives a splendid light to every part of the building, and at the same time gives a very artistic effect, as the ceiling light is in the shape of a large dome of leaded glass giving a very handsome appearance. The balcony is reached by a wide flight of stairs in the rear of the offices; the height from the ground floor to the balcony is fourteen feet and the height from the ground floor to the ceiling light is thirty feet, which gives the whole office a very lofty appearance.

The entire building is finished in quartered white oak. The counter dividing the clerks from the public is of a handsome design and finished on top with a bronze grille to a height of seven feet from the floor.

The electric fittings throughout were designed in conformity with the rest of the work and add very much to the general appearance of the building. In the rear of the offices are situated two tiers of vaults, each vault about ten feet by seven feet.

In the basement is situated the directors room, store-rooms for books, papers, etc., and private and public lavatories, heating plant, coal, etc., etc.

No expense has been spared in order to make the building thoroughly first class and up-to-date in every respect.

The building was designed and carried out under the supervision of Messrs. Finley & Spence, architects.

Mr. J. Wilson Gray, architect, is one of the twelve candidates selected by the Citizens' Committee for the New Educational Board of Toronto.

Old French Houses.

TORONTO MASTER PLUMBERS' ASSOCIATION.

The first monthly entertainment meeting of the master plumbers and supply men of Toronto was held on the evening of November 23rd in the association rooms, 21 Richmond street west. The room was handsomely decorated with flags. About three hundred members and friends assemhled. The meeting was called to order by Mr. Fred. Armstrong, who, after expressing thanks for the large attendance, gave due credit tc Mr. Clapperton, who had been the means of having instituted such social gatherings every alternate meeting. Mr. Armstrong then delivered the following address, which was listened to very attentively by all present:

At a meeting of the Association it was moved by one of the members that each alternate meeting night of the Association be set apart and devoted to social purposes. This idea emanated from a feeling that it would be wise to vary the ordinary routine of business so that it would not become monotonous. At the same time it was not thought desirable to stray too far from our proper field, but to always keep in view the fact that our Association was formed with some definite object in view and for some beneficial purpose. So it was suggested that part of the evening should be devoted to the reading of a paper or the delivering of an address and part to social or entertainment features upon which the committee would decide. I have been honored by the chairman of the committee in being requested to deliver the first address and to take charge of the first night's proceedings, and I may very frankly confess that I accepted this task with no little trepidation, realizing that much of the success of future meetings would depend upon the success of this the inaugural one.

In discussing matters relative to these meetings it was thought advisable that a paper should be read upon some trade question, but I have looked carefully into the matter and have come to the conclusion that upon this occasion it would be better that we should simply have a heart to heart talk upon a subject which is most interesting to every member of the Association, and if what I can say will interest the members I have no doubt it will lead to further addresses or papers being read on trade subjects by the other members of the Association who are more able than I to deal with such weighty matters.

For to-night, therefore, we will talk about our Association, its objects and aims, and apply what I have to say to all those who are interested, directly or indirectly, and endeavor to prove that an association such as we have formed is beneficial not only to master plumbers but to the supply man, to the architect and to the general public. I only regret that more of these are not present to-night so that they might learn that the master plumbers of this city whom they have for some time regarded as a band of pirates sailing on the high sea of commerce holding up the public and making them walk the plank to the tune of higher prices is a body of men intensely interested in the uplifting and upbuilding of a calling which through neglect has fallen from the high position it should occupy until it is looked upon by many with much ridicule and made the butt of every cheap wit. It is our work to alter that opinion, but we must first learn to respect ourselves before we can hope to command the respect of others.

Let us consider the Association as it appeals to and is of interest to the supply man. But first let me say at by Association I do not mean any body of men who are gathered with the sole object in view of enhancing the value of any public commodity. Such a combination was never intended. When the Master Plumbers' Association was formed and since its formation the members have endeavored to discuss every question from an ethical and social as well as a commercial standpoint. Its members are willing to learn and have been taught by the experience of others that in order to do business it is necessary to consider all of the details in connection with that business. They have learned that the question of percentage is a most elusive one and that there are certain fixed charges which must be added to the first cost of an article before it becomes marketable or before they can arrive at the real cost. The object of the Association is therefore to discuss these matters, to consider the proper amount to be charged as a natural and uncontrollable expense in conducting business; to point out the shrinkage which occurs, to make provision for uncollectable accounts, and then consider what is a fair and equitable charge.

The manufacturer and supply man can surely rest assured that they will be paid for their goods when dealing with a body of men thoroughly conversant with business principles, taught the value of doing business in a business-like manner, and not engaged in any system of ruinous competition.

It is also apparent that where all of the men engaged in the business gather together to talk matters over, there will be a general desire to uphold the character of the goods they are handling and no striving for cheap products. Every man in the business will endeavor to use as good an article as the means of his client will permit. It will not therefore be necessary for the supply-man to take chances in the production of cheap articles of uncertain character when he knows that every member of our Association will besitate to recommend anything that does not comply with what the Master Plumbers' Association deem essential for the making of a thoroughly good job. If the supply-men have only to supply good material which they are certain will give them no trouble, to men who understand their business and do their work properly and receive a fair compensation therefor, it is certain that risks are reduced to a minimum, and if they make concessions to members of our Association, it is because they recognize the great benefit it will be to them in conducting their business.

Let us for a moment turn our attention to the architects. We are largely indebted to the good services of these gentlemen for much of the progressive and up-to-date plumbing which is installed in dwellings to-day, and it should not be necessary to use any arguments to convince them that an Association is a good thing. In the city of Toronto there are I believe two associations of architects and every reputable member of that profession belongs to either one or the other. Possibly the most convincing argument which they use is the statement that membership in their Association is an evidence of the ability of its members. If imitation is the sincerest kind of flattery, we pay these gentlemen a compliment in following the good example they have set us in forming an Association where we are just as discriminatory regarding our membership as they could possibly be. We take no man into our Association who is not duly accredited and ultimately hope to arrive at that state where membership in our organization will also be an evidence of a man's real worth and ability.

But there is another phase of the question. The architect designs and prepares specifications but the construction is in the hands of the contractor, and unless there is harmony of interest between the architect and the contractor the best prepared plans and specifications may result in defective work. How can we best effect that harmony of interest. I answer by our Association. Let us endeavor to interest the architects. Let us show them we are proud of our Association; explain the good work we are doing; solicit their assistance, have joint meetings; discuss technical features of plumbing, heating and ventilation and apply our practical knowledge. The result will be that the very best class of work will be done in the city of Toronto. It is good to-day but we can make it better, and who shall say that an association of interests such as I have described will not be a benefit to the architect.

The general public as a rule look with distrust upon combinations, trusts and associations. They say they prevent com-

petition. We answer that our Association does not prevent honest competition but only that which allows a man to figure on work at less than its cost and take a chance that he will be able to scamp it to recoup himself for the loss. It prevents the competition that induces bad work, endangers the life of the occupant of the house and brings many other evils in its train: but fair and honest competition is just as keen as ever it was. The Association merely says that a man shall receive sufficient for his work to enable him to give his undivided attention to every detail in connection therewith, so that when the work is finished it will be perfect in all its parts—an evidence of the ability and skill of the plumber and a credit to the association to which he belongs. There are many other advantages which will accrue to the general public from our Association, but if they receive no other benefit than the fact that they will be assured of good and sanitary plumbing then our association will have accomplished a great deal and the public will have received a most inestimable benefit.

And now let me ask the members present, is the Association a benefit to you? Have we done well in forming our Association? Has it stopped the habit of scrambling after the pennies and awakened you to a full realization of the position you should occupy?

Do you not find that to be a good member of the Association you must make a careful study of the laws of hygiene and sanitation and that you must be familiar with heating and ventilation in all its branches, that you must understand the physics of your profession as well as the practical application of all rules that govern our trade. If you are a good member you will become an expert in all its branches, be reliable and trustworthy. Your best efforts will be given to the uplifting and upbuilding of your business. Your best services will always be at the command of the public but you can demand, and will receive a fair compensation therefor. You lose nothing by being a member of the Association and you have everything to gain. It enlarges your mind and your vision is not dimmed by the petty jealouises that sometimes exist between competitors in the same business. All are equal in the Association. One man is as good as another. A healthy rivalry exists and competition is based on real merit and ability and each man's business grows and prospers according to his individual efforts. Such is the work of our Assnciation. May it continue to grow and prosper. It has had great growth, wonderful development and will grow until it reaches the ideal state I have outlined, if every member is true to himself, true to his organization and obedient to the laws of our Association.

The programme of the evening consisted of songs, recitations and speeches by members, aided by Mr. Bert Harvey. The speakers of the evening included Messrs. Fiddes, McMichael, Anthes, Malcolm. After expressing their gratitude for the enthusiastic way in which the members had worked to organize the Association they touched upon points in Mr. Armstrong's address and expressed their desire to see the Association grow so that it would not only be of benefit to themselves but to the general public.

A unanimous vote of thanks to Mr. Armstrong for his able address was adopted.

The singing of the National Anthem brought to a close a very enjoyable evening.

TESTS OF MASONRY PIERS.

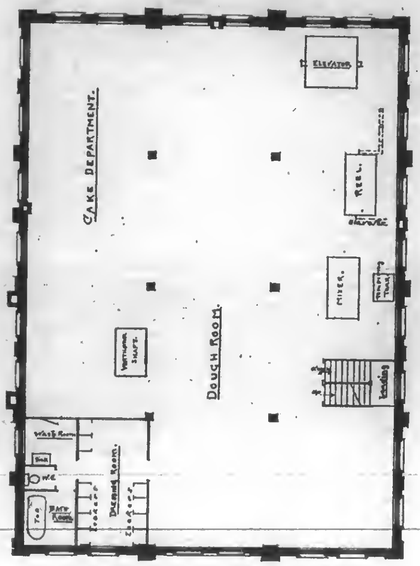
Several years ago the Austrian society of engineers and architects made a very important series of tests of full sized arches brick, stone and concrete, and the report of these trials, together with the accompanying analysis, proved a most valuable contribution to engineering literature. This work has now been supplemented by some important tests upon the strength of masonry piers, the tests being made under the supervision of the same committee which conducted the arch tests, the results being published in a recent issue of the Zeitschrift des Oesterr Ingenieur and Architekten Vereines.

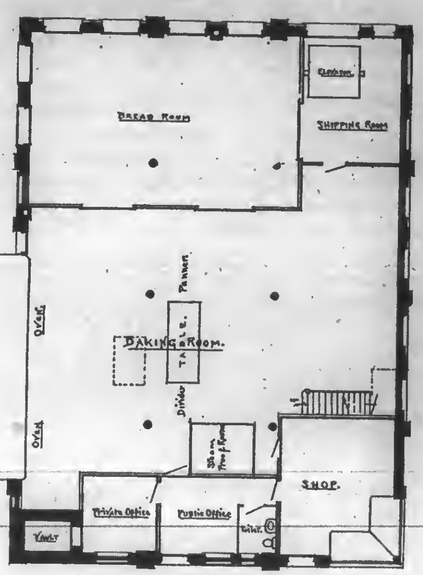
The tests were made in all cases upon one-half metre square in cross section and one metre in height, the pressure being applied by means of a 1,200 ton hydraulic press at the Poldihutte at Kladno. The report gives an illustrated description of this press, which was originally constructed for forging steel, and which had already been employed for testing on similar work by Herr Ludwig Huss, former member of the arch-test committee. The press was carefully calibrated to determine its internal frictional resistances, and the guages upon which the pressures were read being also calibrated, it was possible to determine the true pressure upon the test piers very closely.

Various kinds of piers were subjected to the tests, for the details of which the reader must be referred to the original report. Among those tested were piers of granite, sandstone, concrete, common and reinforced, and brick. The reinforced concrete construction was tested in two different types, one having embedded in it vertical wire rods 12 m in diameter, and the other containing wire cages, of which the principal members were parallel to the surfaces of pressure. In all cases much care was taken to insure that the load should be central, with the exception of certain tests which were purposely made to determine the effect of eccentric loading. The records were taken at the moment of the appearance of the first cracks, and at the time of ultimate crushing, these results being fully tabulated in the report.

The tables are very full in details and but a few results can be given here. Thus a pier of hard bricks laid in Portland cement sustained, after six months, a load of 1,365 pounds per square inch before cracks appeared, and crushed under 2,275 pounds. Granite blocks laid in Portland cement crushed under 8,100 pounds per square inch, while piers of sandstone rubble, laid in Portland cement, showed cracks under a load of 2,750 pounds, and crushed under 3,200 pounds.

The most interesting tests, however, were those which showed the resistance of ordinary and reinforced concrete piers. A pier of solid concrete after 3½ months, crushed under 1,780 pounds per square inch, the rupture taking place almost without warning cracks. A similar pier reinforced by the insertion of vertical wire rods held together by circumferential bands, and tested also after 3½ months stood a pressure of 2,470 pounds per square inch before the appearance of cracks, and crushed only after the application of a load of 3,800 pounds. Even then the pier did not altogether give way, the core remaining partially unbroken. The results of these tests showed the importance of placing the metal reinforcement where it can act to the best advantage. A moderate increase in the strength of the circumferential bands would have added greatly to the strength of the whole pier without adding appreciably to the cost, while the large margin of strength remaining after the appearance of the first cracks show how structures constructed on this principle may be made free from sudden disaster. The care with which these tests were made, and the fullness with which the results are recorded, render this report a valuable document, worthy of association with the large report of the same committee upon arch tests and it adds one more to the many contributions to engineering knowledge by the Austrian Society.





BREAD FACTORY FOR WM. LEES & SON, HAMILTON, ONT.—F. J. RASTRICK & SONS, ARCHITECTS.

RADIATION OR PIPE SURFACE REQUIRED FOR BUILDING, HAVING CONSIDERABLE VARIATIONS IN CONSTRUCTION, SIZE AND TEMPERATURE.*

Mr. Jones said he had not, up to the present time, met with any work that dealt with this difficult subject in an exhaustive manner, and whilst no one appreciated more fully than he did the excellent work of Mr. Chas. Hood, Mr. W. J. Baldwin, Mr. T. Box, Prof. Carpenter, Mr. F. Dye and others, who have given much valuable information, he has also felt that the discrepancies in the various rules and formulæ were so great that a nearer approach to uniformity was sorely needed, and he trusted that the writers referred to would accept these criticisms in the most friendly spirit, and with the assurance that his sole object was an earnest desire to approach a solution of this difficult subject. He would not confine himself to destructive criticism, but would endeavor to crowd as much constructive information as possible into his short paper, in a manner so specific as to give the leading members of his profession food for thought and ample scope for criticism.

He was of opinion that the conflicting opinions had arisen from several causes: First, the uncertainty that existed in the cooling or losses of heat through the glass. Second, by the use of constant, theoretical calculations, or multipliers, which would apply under equal conditions, but were only misleading where extreme variations of temperature existed. Third, that the calculations had not been verified by actual tests.

The results of experimental cooling tests with an iron tube and a glass tube of approximately the same size, exposed at the same time to outside air under similar conditions, were that, with a cast iron tube, the units per super foot, per degree difference per hour, were 1·99, while with the glass tube the figures were 1·72.

What he desired to point out was, that with considerable variations in temperature, any constant or fixed multiple was sure to result in error, because the conditions change with the variations in temperature.

All the authorities referred to were probably correct for stated conditions, and for a small range of temperatures, but he would endeavor to show that for different classes of buildings, and especially for high temperatures, the discrepancies were so great and so confusing that a combined effort should be made to obtain a nearer approach to accuracy.

The cooling atio, or loss of heat by glass, varied so enormously according to the difference in temperature, that the want of unanimity in the tables by different authorities was not at all surprising. Box, T, gave a loss (in units per sq. ft. of glass, per degree difference per hour) varying from ·306 to ·41 for greenhouses and ·504 to ·53 for windows. Professor Carpenter gave ·91 to ·98, while various other authorities, English, Continental, and American, varied from ·776 to 2·248. The difference between the highest and lowest was 630 per cent.

Again, in comparing formulæ, the various authors differed to practically as great an extent. Most of the published rules for obtaining the feet super of radiation were complicated, involving intricate calculations, and occupying more time than could ordinarily be given when preparing estimates. There would be no objection to this, providing the results obtained were such as to justify the extra time and trouble, but, so far as his experience went, this was not the case, for the results were frequently less accurate than those obtained by some simple formula, besides which complicated calculations were apt to lead to mistakes, and his object was to give some simple data that could be quickly grasped by the busy man, and that should give fairly reliable results under varying conditions.

EXTERNAL TEMPERATURES. Fahr.

	0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°
Inside Temp. 40° Fahr.	·8	·75	·65	·56	·5	·45	·38	·34					
45	1·	·89	·8	·72	·62	·55	·48	·42	·36				
50	1·2	1·1	1·	·88	·77	·68	6	·54	·46	·4			
55	1·4	1·3	1·2	1·1	1·	·88	·76	·68	·6	·5	·44		
60	1·7	1·6	1·5	1·4	1·3	1·1	1·	·88	·76	·65	·55	·48	
65	2·	1·9	1·8	1·6	1·5	1·3	1·2	1·1	1·	·88	·75	·62	·52
70	2·5	2·3	2·1	2·	1·8	1·7	1·5	1·4	1·3	1·12	1·	·86	·75
75	3·	2·8	2·7	2·5	2·3	2·1	2·	1·8	1·6	1·5	1·3	1·15	1·
80	3·8	3·6	3·9	3·1	2·9	2·7	2·5	2·2	2·	1·9	1·7	1·5	1·3
85	4·6	4·4	4·2	4·	3·8	3·6	3·3	2·9	2·7	2·5	2·2	2·	1·9
90	5·7	5·5	5·3	5·	4·7	4·5	4·3	4·	3.8	3·4	3·	2·8	2·5
95	7·5	7·2	6·8	6·4	6·	5·7	5·5	5·1	4·7	4·5	4·2	3·9	3·5
100	8·3	8·9	8·1	8·	7·9	7·7	7·5	7·	6·4	6.	5·7	5·4	4·8

(Here followed six comprehensive tables giving the heat ratios [or multipliers] for horticultural buildings. The figures cover the subject very fully, giving the superficial area of heating surface required to give internal temperature of from 40 degs. to 90 degs. Fahr., with external temperature of from 0 degs. to 50 degs., with the water at six different temperatures, from 150 degs. to 200 degs. Fahr. Following these tables are explanatory examples, also reference to other authors, showing that different authorities vary to the extent of nearly 100 per cent. in the radiation recommended for a given area.)

A rule for ordinary brick buildings Mr. Jones stated to be as follows:—To obtain 60 degs. inside when 30 degs. outside; water at 170 degs.—

Glass (G.) feet super. ÷ 6
Exposed Wall (W.) " ÷ 12 } = Feet super. radiation for 60 degs.
Cubic Capacity (C.C.) " ÷ 120 } inside when 30 degs. outside.
For rooms under 5,000 c.ft. capacity.
" " " ÷ 140 " 5,000 to 25,000 " "
" " " ÷ 150 " 25,000 to 100,000 " "
" " " ÷ 160 " over 100,000 " "

The above rule is for ordinary ventilation with one change of air per hour. If two or more changes, add cubic capacity ÷ 200 for each additional change.

In small rooms the glass and wall surface is proportionately greater than in large rooms, and in the latter the walls are thicker and the loss proportionately less, so the divisions are proportioned to meet these changed conditions.

*Abstract of Paper by Walter Jones, presented before the Institution of Heating and Ventilating Engineers of Great Britain.

EXAMPLE.—Suppose a room has 50 ft. of glass, 500 ft. exposed wall, and 5,000 ft. cubic capacity.

G. feet super. 30 ÷ 6 = 8
W. " 500 ÷ 12 = 41 } = 84 ft. super. radiation to give 60 degs. inside when 30 degs. outside and water 170 degs.
C.C. " 5.000 ÷ 140 = 35

Suppose the same room requires two or more changes of air per hour, then C.C. 5,000 ÷ 200 = 25 ft. extra radiation for each additional change of air.

A rule giving the relative pipe surface required for varying temperatures in ordinary back buildings, taking water temperature at 170 degs., inside temperature at 60 degs. and outside temperature at 30 degs. as unity. To be used in conjunction with the preceding rule.

Mr. Jones stated that in comparing the radiation given by various authorities for attaining the high temperatures required in drying-rooms the greatest possible variation in figures is found.

In giving a diagram (which cannot be reproduced here) plotted out with the rise in temperature to be expected with a given area of heating surface, when the outer air is at different temperatures, the results obtained are briefly these:—

The radiation reouired to give from 0 degs. to 45 degs. will give approximately from 10 degs. to 50 degs.
" " " 20 " 55 "
" " " 30 " 60 "
" " " 40 " 65 "
" " " 50 " 70 "
" " " 70 " 75 "

In other words, the radiation that will give a rise of 45 degs. from 0 deg. to 45 degs. will only afford 15 degs. rise from 60 degs. to 75 degs.

The question now naturally arises, why the heat ratios or multipliers for horticultural buildings should not apply to ordinary brick buildings, and why should the progressive ratio in the table for brick buildings differ so materially. Three reasons might be given, which would probably account for this:—

First.—The data or starting point differs; the conditions are also different; hence the ratios or calculations must be made to conform with the altered conditions.

Second.—The radiation required to give 60 degs inside, when 30 degs. outside, in ordinary buildings, is approximately 15 ft. super. per 1,000 cubic feet, and for glass buildings it is about 50 to 70 ft. super. per 1,000 cubic feet, or four times the amount to obtain the same temperature.

Third.—Mr. T. Box, in his excellent treatise on heat, gave what appeared to Mr. Jones to be conclusive evidence that the losses from large glass surfaces are proportionately less than for small glass surfaces, or about ·306 units of heat per square foot per degree per difference per hour for greenhouses, as against ·504 units for ordinary windows.

BY THE WAY.

The Japanese method of house construction is said to be to put on the roof as soon as necessary supports are in place, and afterwards build the lower part. Some of the modern skyscrapers are being built on this plan—the casing of the steel skeleton commencing at the top.

x x x

When an attempt was made to start the furnace in a church at Pelee Island, Ont., the other day, the apparatus would not work. Investigation revealed that during the summer a swarm of bees had taken up their abode in the chimney, and stored up therein so large a quantity of honey as to completely block the flue.

x x x

Apropos of the article in November issue of this Journal on the new Majestic Theatre, Toronto. A daily paper's report of a recent performance states that "the sensational fire scene and rescue brought down the curtain of the third act amid tremendous applause," I shall not be surprised if some day there should be a still more sensational fire scene which would not only bring down the curtain but also the building.

x x x

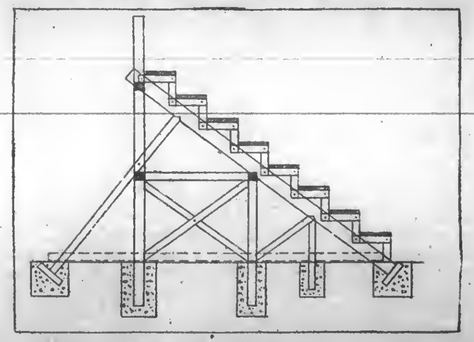
Two serious explosions of acetylene gas occurred in Western Ontario last month. In one instances a commercial building was wrecked, while the other resulted in the collapse of a church during the progress of an entertainment, and the serious injury of a number of persons, including the minister. It is quite time that the Insurance and building regulations were so amended as to compel acelylene gas generators to be installed in separate buildings at a safe distance from inhabietd structures.

x x x

A British Architectural Journal indignantly refutes the statement of Mr. Yerkes, manager of the London twopenny tube, that English workmen cannot build tall chimneys from the inside as is done by German bricklayers. In proof of the absurdity of the statement it declares: "German workmen are just as fat and heavy as our own, and require just as much scaffolding to hold them up; while, as for agility and intrepidity, we do not suppose any workmen surpass our own scaffold fixers."

PLAN FOR A GRAND STAND.

Attention has been called in these columns to several serious accidents which have resulted from the failure of heavily loaded grand stands. The proper construction of such stands should therefore be a subject of interest to architects and builders.



DESIGN FOR A GRAND STAND.

We reproduce herewith a sketch for a stand contributed by J. Barsley to an English publication. The uprights below ground level are proposed to be well tarred and set in concrete. The dotted lines indicate additional bearer if it is not proposed to fix the structure to the ground.

MATERIAL AND TECHNIQUE IN DESIGN.

By Prof. Percy E. Nobbs.

Note By The Author:—These three short papers (1) Drawing and Architecture; (2) The Styles of Architecture; (3) Material and Design; are intended as an introductioo to the study of Architecture for students assumed to possess no knowledge of the subject, and the themes are treated with regard to their bearing on study only. They were delivered at McGill University this September.

We have dealt thus far with the two great branches of architectural study (and by architectural study we must understand training in those things which lead up to the art of designing. In drawing we have the written side of our language; in building the living words with which the artist in stone and mortar speaks to his public. The idea of an artist without a public is, by the way, impossible: still there are wondrous few outside the architectural profession who understand. By the styles in the common acceptation, we must understand the traditional metric forms in which to string our poems; by style in the higher sense, we mean all that makes for character in work—good or bad. To-day it is with the proper structure of our architectural language that we have to deal,—that is the fundemental basis of design.

All modes of expression have one purpose—the conveyance of ideas from one man to another by means of the senses: and it is hardly necessary to add, true ideas. This power was not evolved that man might deceive his brother. The entire advance of man to the position we find him in to-day is based upon the acquisition of power to convey ideas to be accepted as true, or perhaps honest is a better word, for truth is after all a comparative affair—between the scientific truth of to-day and "the happy truth the careless angels know" there is a great gulf still fixed.

It will take us years of study to really appreciate this truthful quality in all great architecture, and it is only with a small side of this truthfulness that we have to do to-day, but it is necessary to understand something of this from the beginning of our studies in order to be on our guard against the lie in design. If we were simple XIII century craftsmen there would be no such need, but we are sophisticated XX century students, and the world is full of untruthful design, and when a lie is repeated often enough we are very apt to take it for gospel.

Now the particular type of lie we have to consider is the lie of material. The very basis of all design is knowledge of material (and the idea of material necessarily carries with it the process by which that material can be wrought—the technique, that is.) Of course before we design a thing we must thoroughly understand its purpose, but that is not the basis of design. That knowledge is shared equally at least by the client or the man who will use the thing, and there are men who know what is wanted to perfection, but who cannot design, and incidentally it is well for the professional designer that this is so (Mr. Kipling's "Story of Ung" contains the most brilliant exposition of this in our language). The state and form with which a designer invests an object depends at every turn upon the stuff it is made of and the way the workman will make it. There are other things than this in design, but this is the touchstone, the one essential.

THERE IS NO SUCH THING IN NATURE, NOR IN ARCHITECTURE (NOR IN ANY OTHER ART I THINK) AS ABSTRACT BEAUTY OF FORM, WITHOUT RELATION TO THE USE, MATERIAL AND STRUCTURE OF THE OBJECT.

The world of art has been mazed long enough among the unprofitable theories, about art appealing direct to the emotions and the glorification of the work of art for its own sake. We must have a good deal more than pure reason in anything that is designed before it becomes a work of art, but where that is lacking as a basis, the thing is fit for nothing but to be regarded as a more or less interesting exercise of skillful fingers.

We are all of us aware that building materials have differen characteristics without taking a scientific course on the subject. Stones are heavy and vary in size; Bricks are all of one size. Wood is obtainable in great lengths, cuts well, has strength of different kinds in different directions and shrinks. Steel has enormous strength in tension and considerable in compression. Wrought iron and cast iron have very different characteristics of strength and technique. Plaster is worked soft and set hard. Sheet metal bends. So with every material we can call to mind —we find differences in strength, texture and manipulation, all interdependent. This is what is meant when we speak of the genius of the material.

Truism No. 1—Some materials are more suited to certain purposes than others. We blush to indite anything so obvious, yet designers habitually ignore this fact or acknowledge it only by imitating in one material, another which they consider obviously the more suitable for the purpose.

Truism No. 2—Each material has its own process by which it may be reduced to serve a suitable purpose.—As obvious as No. 1 and yet mere frequently ignored in design.

Next year we shall go through a course on the techniques for all materials the architect comes in contact with,—stone, plaster, wrought iron, stained glass, mosaic and the rest, and our study will take the form of preparing detailed drawings, for the trades using these materials. This will be of great profit to us if we can draw well enough by that time. This by the way.

To reduce our present enquiry to a brief lecture hour we shall consider wood and stone only. There are hundreds of kinds of each, and every kind has its particular genius for beauty if used the right way, and a very important part of the designer's work is the study of woods and stones on this account.

It is to wood in general and stone in general that we shall confine our attention as an illustration of the axioms above laid down.

After stone has been broken into our service by such rough weapons as blasting powder, the pick and the hammer, it is reduced to shape by use of the point held in the mason's left hand and the mall or mallet wielded in his right. The stone is chipped or powdered away till the desired form is reached. This is the general process of reducing stone to our purposes and is illustrated happily on the coat of arms of Melrose Abbey in Scotland—it is a "canting coat" and may or may not contain the derivation of the name. In chief is a rose and below it a mell—thus happily symbolizing the delicate and intricate beauty of that wondrous Abbey and the mason's simple tools which wrought the fair plain ashlar and the moulded piers, the traceried windows and the crockets and bosses so "bellysh ycarven";—they are better carved nowhere.

In wood, we find in the grain and fibre a natural structure so different from that of stone that it is only rational to expect a totally different technique and a totally different kind of strength. Where the one breaks the other bends and tears. It will serve no useful purpose to work out the comparison here; we need only think of the two things to realize a thousand essential differences. The saw, the axe, the chisel, the plane, the fibrous chips and the long and curling ribbons, and above and beyond all the circumstance that wood shrinks and warps and if exposed to be wet and dry alternately rots, are all facts full of meaning which throng the mind when we bestow a thought upon the matter.

Obvious as all this is we must note it down and decide to keep it ever in view before submitting to be influenced by those same styles we considered last time, for in their study there lurk a hundred subtle temptations to us to forget those differences of materials.

"Let your wood be wood and your stone be stone," is the architect's application of the great yae aod nae commandment.

In pointing out a few local examples of this tendency to torget the natural way to treat materials it must not be supposed that this is a specially Canadian vice. It is as widespread as the tendency to pretend we are better than we know we are, and quite as futile.

Gothic window tracery as we find it in its fullest and finest development about 1500 A.D., is perhaps the purest one-material-evolved class of work within the realm of architecture. In the early XII Century churches narrow, lancet headed windows were used and in gables it soon became the practice to group these in twos, threes or fives, or even sevens side by side, as in the north transept at York Minster. The wall between each light was still kept the full thickness. The next step was to put circular windows over the heads of the range of lancet lights. The next development was the constructional arch to span the space occupied by all these lights as the wall was so much cut up. Then the space within the arch was made thinner than the rest of the wall, the lights come nearer together and the circular hole in the axpex of the arch gives way to such forms as trefoils or quatrefoils fitting more closely between the lancet heads. For ease in construction large slabs of stone 8 or 10 inches thick came to be used and these openings were pierced in them. This is plate tracery. As the construction became more skillful less and less of the plate was left, the piercings fitted closer into the spaces between the heads of the lights, etc., and real tracery is the result about 1250. Through the development of cusps and orders it is unnecessary here to go; enough has been said to prove the stony pedigree of the gothic window.

We have around us churches making more or less claim to be characterized as Gothic buildings and in a great many cases the tracery is of wood, reproducing to the best of its ability the forms which of right belong to stone and the "solecism" is none the less because such windows are painted to match the surrounding stonework. In matters of taste there is a right and a wrong as elsewhere, and anything sham about a building is as much to be reprehended as anything sham about an individual. When this sort of thing is done by way of embellishment to a place of worship the artifice seems peculiarly misplaced. Had such windows been frankly designed for wood construction no offence would have been there—they might or might not have been well designed; that is another matter. The reason why they were executed in wood was presumably economy or conceivably on climatic grounds. The reason why the shapes, sizes and design of stone windows was followed is that the building was to be "Gothic." The letter not the spirit of the law is here manifest, for the spirit of Gothic work is this above all things—Truth in construction, truth in materials and obvious, potent, exposed truth at that. That is the main reason why we shall study Gothic work here. It will habituate our minds to constructive and material honesty in design.

There are many kindred cases to the one above which meet our eyes in any modern town. It is wonderful how little of the ordinary common building that is done does not stand the test of this question of the material honesty.

We shall soon see in studying the evolution of architectural forms how great a part this translation of features from one material into another has played in the production of new forms when rightly done.

Forms originally evolved in wood may be translated to stone and vice versa with the happiest results, but they must not be wholesale imitations, with intent to deceive but rational adaptations.

The Greek Doric for instance was originally a wooden style of construction and the wooden forms still remain though they have lost all wooden meaning and appearance. Nothing that has been built has a more stony appearance than the Doric temple.

A case of the translation of stone to wood on the other hand is presented in Gothic screen work. We have seen how window tracery developed till it became the joy and glory of the church builders and the forms evolved within the mullioned window are found in screens, organ cases, wall panelling and stall canopies, but with very marked differences which make them perfectly suitable in their new places. The reduction of these stone forms in scale and their adaptation to wood construction and carvers' tools is what renders them at once right and beautiful.

A peculiarly futile type of hypocrisy manifests itself in such buildings as have different materials on their different fronts. Of course in city streets where buildings stand "cheek by jowl"; where the back is only the side of a light well—stone to the street and glazed brick to the back is obviously the best thing that can be done. It is usually the intensely respectable villa residence that is guilty of the enormity under consideration. Why so many corner houses should have stone fronts to a main street and brick fronts to side streets has never been clear to me. Nothing possessed of powers of locomotion and sight can be deceived by this depraved tradition (for it has become a tradition).

These sort of things pervade our modern surroundings and they will testify to our children's children of a great deal of hollowness and lack of ingenuousness in XIX and possibly in XX century life. We need not heap up examples. Once we set ourselves to seek for honest work it is extraordinary how much that is spurious and mean will assail the eyes. Where ignorance is bliss it may be folly, but it certainly is a duty to be wise.

To sum up these three opening lectures in a sentence—the study of these things which lead up to the art of designing may be enumerated in three words corresponding to these three lectures—Drawing, Old Work and Construction; by means of the first we study the second and thereby realize how truly the third may be said to be the fundamental basis of our art.

The new Cathedral in Liverpool will be built of red sandstone. The method advocated of determining the thickness of plate glass for windows to withstand wind pressure and vibration from traffic is to proportion the shearing section (the marginal or bearing length multiplied by the thickness) so as not to exceed the safe tensile strength.

NOTES.

The Architects' Registration Bill has been carefully revised, and the British Society of Architects will spare no effort to secure its passage.

Mr. Chas. Baillairge, who for many years has ably discharged the duties of City Engineer of Quebec, recently resigned the position, and is succeeded by his son, Mr. W. D. Baillairge.

Many new ceilings are whitened before they are quite dry, the result being that they have a smeary appearance when finished. Should there be any sign of moisture on a ceiling it is not in a proper condition to be whitened.

Prof. Capper, late of McGill University, Montreal, now professor of architecture at Owens College, Manchester, has given the first of a series of lectures at that institution on the work of the monastic orders in relation to architecture.

The fourth international conference for testing building material is to be held next year at St. Petersburg, Russia, in the month of August. Herr Fetmager, professor of the technical high school at Vienna, Austria, has been chosen president of the conference.

A course of six lectures will be given during the coming winter in the gallery of the Montreal Art Association. These will include an address by Mr. Edward Robinson, curator of the Boston Museum of Fine Arts, on Greek Sculpture, and by Dr. R. Tait Mackenzie, on Artistic Anatomy.

The late Viollett-le-Duc wrote that one of the most interesting examples of architecture in all France on account of its simplicity, perfect shape, and harmony of detail, was the Cathedral at Chartres. The north steeple of this unique piece of twelfth century architecture has lately shown signs of decay, but fortunately the Government architects have now taken in hand its restoration. The "old tower" of the cathedral, surmounted by an octagonal spire, is 350 feet high, being shorter than its sister (built in the sixteenth century by Jean de Beauce), but far more interesting.

The attention of Canadian architects and architectural students is directed to the advertisement appearing in the present number referring to the Annual Examinations of the R.I.B.A. It was a matter of regret that no Canadian candidates presented themselves for these examinations last year. It is hoped that a number will go up for examination in 1904. Any information required regarding these examinations will be cheerfully supplied by Mr. Andrew T. Taylor, F.R.I.B.A., 80 St. Francois Xavier st., Montreal, who is the representative in Canada of the Royal Institute of British Architects.

"The requirements of modern civilization are so varied and complex, and we live at such a rapid pace, that even the practice of architecture has been invaded by 'specialists' who apparently imagine that a thorough knowledge of technical details will compensate for a lack of knowledge of the art of their profession. There are hardly any modern pretenders so lacking in justification by their works as that of the architectural expert or specialist. It may be argued that this is the only scientific method of dealing with modern complicated requirements; if so, its scientific efficiency hardly justifies its artistic barrenness. My earnest advice to you is to make your practice cover as wide a field as possible; shun specialism, however lucrative it may appear."—Mr. J. S. Gibson.

A man whose business it is to sell sash ventilators claims to have made an interesting discovery the other day, says the New York Engineering Review. He was equipping an office, on about the fifteenth floor of one of the tall office buildings, where he found that his ingenuity could not succeed in drawing in any outside air. After spending considerable time and visiting the various floors he states that he found on the lower floors a very strong influx of outer air through the window, passing through the room, out of the transom above the door and into the hallway. There he says it was sucked up by the elevator, which is rather doubtful, because the elevator presumably sucks downward as well as upward. At all events, there was a strong current of upward air through the ventilator shafts and, there being no outlet at the top of the shaft, it found its way out through the windows of the offices on the higher floors. The effect therefore is that the occupants of those upper floors are breathing the discharged air from the lower floors. This is quite likely to be the case under many atmospheric conditions.

THE ONTARIO ASSOCIATION OF ARCHITECTS

Arrangements have been made for the annual convention, which will be held in Toronto on Tuesday, January 12th and Wednesday, January 13th, 1904.

Upon the afternoon of the first day an address will be given by Prof. R. C. Carpenter, of Cornell University, upon "Heating," a subject upon which he has written a book well-known as a standard volume.

On Wednesday morning, Prof. Percy E. Nobbs, A.R.I.B.A., of McGill University, Montreal, will give a paper upon "The Delineation of Architecture," and will give examples of various methods of rendering. It is hoped that a very full discussion will follow this address.

The Wednesday afternoon meeting will be addressed by Prof. J. Mavor, of Toronto University, on "Recent Developments in the Planning and Improvement of Cities in Europe and America" and Mr. Frederick G. Todd, of Montreal will, describe the "The Advantages of a Park System." The exhibition of architectural drawings will be opened on Tuesday evening and upon Wednesday evening there will be a banquet in the King Edward Hotel. It is expected that members of the Association from many places in Ontario will be present.

HEIGHTS OF FAMOUS BUILDINGS.

		Feet
1.	Old St. Paul's, London	534
2.	Cologne Cathedral	517
3.	Rouen Cathedral	492
4.	St. Nicholas, Hamburg	473
5.	Anvers Cathedral	472
6.	St. Peter's, Rome	469
7.	Strasburg Cathedral	465
8.	Great Pyramid	460
9.	St. Stephen's Cathedral, Vienna	441
10.	St. Pollux Chimney, Glasgow	435
11.	Salisbury Cathedral	404
12.	Antwerp Cathedral	403
13.	Chartres Cathedral	403
14.	Friburg Cathedral	385
15.	Amiens Cathedral	383
16.	Florence Cathedral	376
17.	St. Paul's, London	360
18.	Houses of Parliament (Victoria Tower)	331
19.	Campanile of St. Mark's, Venice	323
20.	Mechlin Cathedral	319
21.	Norwich Cathedral	309
22.	St. Genevieve, Paris	274
23.	Chichester Cathedral	271
24.	Campanile, Florence	266
25.	Lichfield Cathedral	252
26.	Canterbury Cathedral	235
27.	Taj Mahal, Agra	220
28.	The Monument, London	202
29.	Porcelain Tower, Nankin	200
30.	York Cathedral	198
31.	Crystal Palace (central transept)	198
32.	Baptistry, Pisa	190
33.	Leaning Tower, Pisa	183
34.	St. Sophia, Constantinople	182
35.	Colosseum, Rome	157
36.	Albert Hall, London	154
37.	Pantheon, Rome	143
38.	St. George's Hall, Liverpool	85
39.	Temple of Trexor, Egypt	70
40.	Parthenon, Athens	66

Mr. Henry Simpson, architect, has announced himself a candidate for the Board of Education of that city.

The carpenters' strike in Pretoria is over, and the men's demand for a standard wage of £6 19s per week of forty-eight hours has been agreed to.

CORRESPONDENCE

FOREIGN RECOGNITION OF CANADIAN SKILL.

DEC. 11TH, 1903.

To the Editor of the CANADIAN ARCHITECT AND BUILDER.

SIR,—In your issue of November under the heading of "Foreign Recognition of Canadian Skill" you refer to a Canadian artist receiving several commissions for memorial windows from the United States—and express astonishment at the fact that "an order amounting to about $10,000.00 for memorial windows to be placed in a church in Montreal was given to a U.S. firm" and that the duty of 30% paid on these windows was afterwards refunded by the Government; and your article suggested that "an explanation should be demanded of the Canadian Minister of Customs."

Apropos of this the writer wishes to say that very little blame can be attached to the Minister of Customs; (the Hon. Mr. Patterson,) although the facts are as you state. The Minister was interviewed and the facts as he gave them are, that for many years back, previous to the present Liberal administration, this custom had been followed, and by special Order-in-Council the duty was refunded, and it was difficult to draw the line without apparent discrimination to the particular ecclesiastical body that made the application. And further that the application for the refund of duty required had always been accompanied by a sworn declaration that it was impossible to execute this work in Canada. Let us hope that the ecclesiastics, on the supporters of religion, sinned in ignorance.

The Minister promised, and we believe he has carried out his promise, that this should cease. No fault can be found if the work should happen to have been that of a professional artist, such as Mr. Holiday, Frank Brangyn, Mr. Richardson, and others,—but these refunds were asked for and given on purely "commercial work," that is to say—work where the identity of the artist was sunk in the firm carrying out the order. Productions executed by artists of the "status" of these gentlemen would only benefit the taste for good productions in stained glass, and rightly so, might be admitted free, but all of the work carried out by "commercial stained glass firms" either in the United States, England, the Continent—the price being equally good, could be executed here.

Before concluding the writer would like to add that a prominent protectionist in Montreal, a gentleman who is about to seek the suffrage of the "electorate" with the purpose of imposing upon the people of Canada a high protective tariff was largely instrumental in placing the above order referred to in the United States.

This, I think, Mr. Editor should illustrate the insincerity of the "protectionists" who are "free-traders" for themselves, but "protectionists" when "others" are the purchasers.

Trusting this explanation will clear the present Minister of the blame your article imposes upon him.

I beg to remain,

Yours very truly,

"VERITAS."

VENTILATING SYSTEMS.

TORONTO, December 4, 1903.

To the Editor of the CANADIAN ARCHITECT AND BUILDER:

SIR,—I note a letter in your November issue, calling attention to the ventilation of the McIntyre Building at Winnipeg. The writer of the letter invites criticism and states that a discussion on the subject might be interesting and instructive. I quite agree with him on that point, but believe that the discussion should be on the ventilation of this building in particular, rather than on the system in general.

In order to discuss it intelligently it would be necessary for us to know the size of the building, its sub-divisions, the nature of business carried on, apartments and the number of occupants, the size of the vent shafts and the openings into the different apartments, together with their location. What provision is made for the admission of fresh air and have we to depend on gravity alone for the draft in the flues, or is artificial means provided?

We would also have to agree on a definition of ventilation which I understand to be the admission of fresh air in sufficient quantities to diffuse, dispel or drive out all vitiated air, or air containing more than from two to four parts of carbonic acid, in 10,000 parts, the air to be taken from a reliable source and to be distributed in desired quantities throughout the different apartments, according to their requirements; the entire system to be positive in its action and under the control of the operator.

In taking this matter up I think it would be well to have an approximate estimate of what the installation of this system cost; we would then be in a position to make a comparison of the costs of the various systems. My own opinion is that a mechanical device could be installed for a little over the cost of gravity ventilation, while the cost of operation would be very small if you take the results into consideration.

I take this matter up as I am interested in ventilation and I would be very glad to see a general discussion upon this question.

Respectfully yours,

VENTILATION.

NORTHWEST LETTER.

WINNIPEG December 14, 1902.

Although the winter has now thoroughly taken hold of this country and the thermometer has already registered as much as 25 degrees below zero on several occasions, building operations have by no means come to a standstill. It is most satisfactory to note this, for at no distant date it was universally considered, and is so yet by those not acquainted with the actual conditions, that for a period of some four months duration building of all description was compelled to cease. Work is now progressing in all trades and although the severe weather makes the cost much in excess of normal prices, on account of heating, etc., required, the cold weather does not prohibit the carrying out of good work. If these points were more widely advertised it would dispel the illusion many people hold, that because the thermometer at times registers as much as 40 below zero, work of all kinds must be suspended for the whole of the winter. This belief is held more particularly by those in the "Old Country," and if these facts could be brought to their notice it would help materially in encouraging good mechanics to immigrate to these western provinces. A present difficulty in building, on account of the great amount of work in hand, is the scarcity of skilled labor and much work has been hampered this year for this reason. The enormous amount of building, compared with former years, and the lack of labor will necessitate, for the completion of same to be realized before spring, the carrying on of the work throughout the winter months, and although it may be a loss to contractors in many cases, it will benefit the country at large, in that it will not only give continuous employment to the trades but it will more establish the truth and destroy the fallacy regarding building in winter.

The carpenters' strike which took place late in the summer retarded work to some extent. The disturbance was the usual several complaints of the Union, viz: a nine hour day from seven to five, a minimum wage of 35 cents and the recognition of the Union. No prolonged lockout took place and in a number of cases the employers agreed to the demands of the Union immediately upon receiving a notification specifying their requests. In some instances the men were out several weeks, but these cases were rare. Some seventy-five, more or less, masters have up to date agreed upon several points demanded by the Union, which agreement holds both parties for one year. The employers who refused to submit to the demands number about fifteen and include some of the large firms of the city. As no association of master carpenters exists in Winnipeg, the difficulty found by the Union was that each contractor had to be notified individually and each acted according to his own judgment. The advisability of setting the minimum wage at 35 cents appears on looking into the matter to be questionable. Taking a nine hour day with eight hours Saturday at 35 cents, gives a weekly wage of $18.55. This amount for a minimum appeals to one as rather high. There must be many instances in the carpentering trade where rough work is done, especially in a growing country such as this, where the labor cannot possibly be worth that amount. Many men there are who are worth no more than say 30 cents but who can perform this rough class of work as well as a thoroughly experienced man. It would be different if work was scarce and labor plentiful and where the good men would be frequently discharged in favor of the cheaper ones, but this is not the case. When such time arrives then the Union can protect the best mechanics but in the meantime the contractor or public must pay the price and consequently building becomes more expensive and the class of work stands still.

The subject of trade unions brings to one's mind the desirability of a "union" among architects. Not on the lines of protecting themselves as is the case of the trades, but for the protection of the public and the advancement of the art. On this theme I should like to bring to your notice some points that have impressed me as illustrating the great need of such an association to be formed in Winnipeg. Things in the profession are at present being carried on in a very loose way. Some years ago the resident architects in the province submitted a bill to the local Legislature petitioning them to grant a charter to an association formed of resident architects empowering them to prevent any outside architect practising without first becoming members of the provincial association and thus making it a close profession. This idea of "union" is not of a very high order as it was apparently one meant, I am given to understand, not to further the interests of the profession but only to act as a barrier against outside men from entering the province. What is needed is an association formed on the basis of the Ontario Association or other similar body with the direct object of raising the standard of architects and of work done. This can only be accomplished by educating students of the rising generation by the help of the Association and by making it compulsory to pass certain examinations before being allowed to qualify as architects. This might be done by an association being formed and a bill being authorized which would make it necessary for such qualifying examinations to be passed before one would be allowed to practice and for the measure to take effect say five years from the date of the introduction of same. This procedure has of course been ineffectually placed before the Ontario House on several occasions but Quebec has been more fortunate and Manitoba might do likewise. The present manner of practising architecture necessarily reduces work to the very lowest standard and it seems an injustice to the public that any man on the street can, when the whim takes him or when a prospective job looms up, place the word Architect after his name and publicly practice as such. It would be most unfair to cause those who were not architecturally educated to a specified level to cease from practising the profession, but it would be most just to compel those who were not competent from the public safety standpoint, to withdraw the designation "architect" from their names. The free use of the word by such a nondescript class has become such that in some cases, with a certain public, it is simply synonymous with "Jerry Builder." This does not exaggerate the prevailing practice in any way or form, and in fact one would hardly dare to describe the exact condition of affairs in this direction. The course now open is, for those architects who feel that the exigencies of the case demands it, and regard the profession as one worthy of protection and who can realize the effect of the continuous practice as now prevalent, to join in forming an Association as above for the repression of a system that can do nothing but lower the status of all concerned.

Taking leave of "Unions"—the city of Winnipeg tax papers are now being presented and show a rate of 21.50 mills made up as follows: schools 4.38, municipal commissioners .23, public parks .50, municipal expediture 16.39. Total amount of taxes levied $779,878.10 on an assessment of $36,264,920. To keep the rate of 21.50 mills throughout the "business tax," is arrived at in a strange manner. It is done by multiplying the actual annual rental by four or five so that although the rate is really 95.50 mills it reduces it to the 21.50 mills required. The tenant of an office or a shop having a rental of say $1000 pays $91.50 on shop or office. This business tax is of course in addition to the regular tax of 21.50 mills on the assessed value of the building and land. It is hard to obtain information as to the reason of this apparent extortion, but of course there is a reason, and that is supposed to be sufficient information for the taxpayer. To carry on the administration of the city's wants it requires that the amount of money expended must be paid, but the equity of proportioning the taxes in this manner looks on the face of it doubtful.

The prospects of building for 1904 look very cheerful. Although the total amount of building permits issued in 1903 aggregated to something like $6,000,000 the feeling at present is that this amount will probably be doubled next year. The C.P.R. improvements, the agreement of which has now been finally signed by the city, will entail an expenditure of something like $2,500,000. The whole of this project may not be proceeded with next year but the building of the subway is definitely settled.

MANITOBAN.

A SUGGESTION.

Toronto has recently rounded out her suburban park system by the purchase from the Dominion Government of the garrison common extending

FIG. 1.

along the lake shore to the exhibition grounds. When improved this will form a combined park and driveway unsurpassed probably by any on this continent. The city is still in urgent need of one or more squares in the business district. The Council having decided that the proposed new Public Library building shall be located down town, the opportunity is afforded of placing it in the centre of a public square convenient to the business district. In order that the building may form one of the prominent architectural features of the city, and be well lighted, it should have an ample site. Why not as it were kill two birds with the one stone, by purchasing a site which would add to the appearance of the library building and of sufficient area to meet the requirements of a public square? The opportunity should not be missed of thus accomplishing both objects at a minimum cost.

FIG. 2.

TESTED FIREPROOFING.

To the Editor of the CANADIAN ARCHITECT AND BUILDER.

SIR,—A publication in Chicago which represents the Tile Manufactures, has been making a record for itself in attempting to belittle all other forms of fireproofing and is especially bitter in condemnation of concrete as a fireproofing material. They make use of some mishaps during construction, to argue that concrete is unreliable and lacks strength as a fireproofing material.

A great many accidents have happened to brick or terra cotta blocks, but that does not condemn their use in buildings.

After all the real test of fireproof construction and the test upon which one can form a correct judgment is an actual fire in a building, and from the effect of such a fire upon the materials used one can judge as to whether the construction is reliable or not.

We propose to print cuts showing the effects of fires in a number of buildings, some of them where terra cotta was used as a fireproof material and some buildings where the concrete system was adopted.

Illustration 1 shows the Horne building in Pittsburg, Pa., where the fire burnt out the woodwork and contents, but was not hot enough to destroy the stonework on the front; it was hot enough to destroy the terra cotta floors throughout a great part of the building, necessitating rebuilding of all the floors.

Illustration 2 it is a case where a small fire occurred in a pipe shaft in the Old Colony Building, Chicago. There was supposed to be nothing combustible in the shaft, but there was some pipe covering and some pieces of board and these caught fire. Even with this small confined fire, the heat was sufficient to displace the terra cotta partition, adjoining the shaft.

In another issue we will illustrate some cases of fire in buildings where concrete systems were used.

F. W. BARRETT,
Manager Expanded Metal Co., Toronto.

BUSINESS NOTES.

Architects and others should be interested in the announcement in this number of Messrs. Sheldon & Sheldon, of Galt, Ont. It has reference to their hot blast system of heating for schools, hospitals and other public buildiogs, factories, etc. They are successors to the McEachren Heating and Ventilating Co. and have had a long experience in this line. Particulars regarding their method of heating will be furnished any reader who will drop them a post card mentioning this journal.

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The Royal Institute of British Architects desiring to give facilities for those in the Colonies to qualify by examination for associateship in the R.I.B.A., will hold the fourth examination from June 14th to July 1st, 1904, in Montreal. Applications, fees and probationary work must reach London by the first mail arriving after April 9th, 1904 Intending candidates who must be not less than 25 years of age, can obtain application forms and copies of the previous examinations on application to

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EDITOR'S ANNOUNCEMENTS.

Contributions of value to the persons in whose interest this journal is published are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

Subscribers who may change their address should give prompt notice of same. In doing so, give both old and new address. Notify the publishers of any irregularity in delivery.

NOTE.

A new building by-law for Winnipeg is in course of preparation, some of the clauses of which must receive the approval of the legislature.

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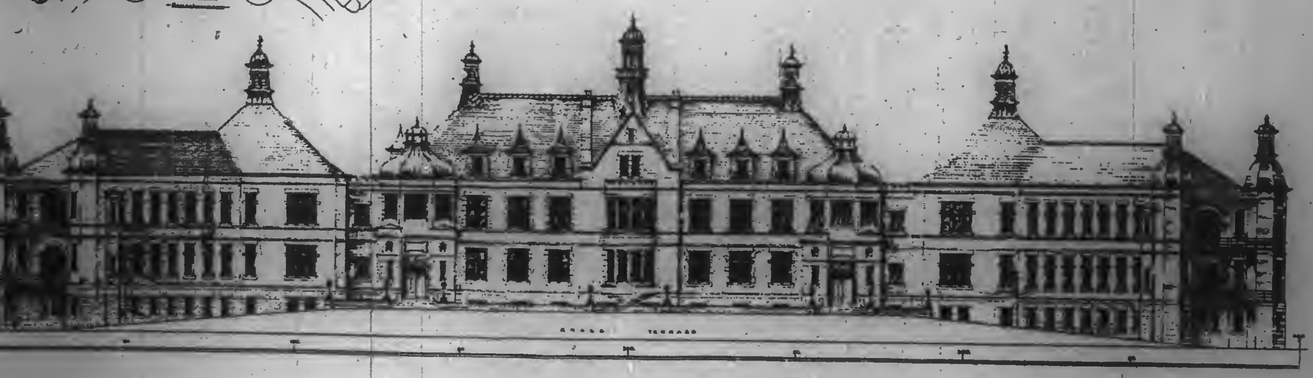
Architect



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The Canadian Architect and Builder

Vol. XVII.—No. 193. JANUARY, 1904.

ILLUSTRATIONS ON SHEETS.

From an Old Chair—A Good Model for a Simple Dining Room Chair.
Old Chair from Hatherly's Life Class Studio, London.
Old Chair at Hampton Court, London.
(a) Adams, about 1870, Mahogany Inlaid. (b) Heppelwhite, about 1780, Painted. (c) Chippendale, about 1760, Walnut.
Settee, Walnut and Veneer, English, 1760-1780, Owned by South Kensington Museum.
Ancient Mosaic, Ravenna.
The Percy Shrine, Beverley Minster.
Ospedale Maggiore, Milano.

ILLUSTRATIONS IN TEXT.

Illustrations Accompanying Article on Plaster Decoration Modelled and Handwrought by Prof. Percy E. Nobbs.
Illustrations Accompanying an Article on L'Art Nouveau, by Mr. W. A. Langton.
Portraits of Officers of National Association of Master Painters and Decorators.

CONTENTS

Editorial	1	The O. A. A. Exhibition	16
Tendencies of Wall Paper Design	2	Province of Quebec Association of Architects	16
Plants in Decoration	3	The Colored Interior Decoration of Architecture	17
Plaster Decoration, Modelled and Handwrought	4-5-6-7	Sand for Building	18
Household Furniture, Old and New	8-9	Fireproofing Methods	18
Ode to an Architect	9	Decorative Cement Products	19-20-21
L'Art Noveau	10-11	The Late Mr. J. F. Peachy	23
Modern Domestic Architecture	11	By the Way	24
Painters' and Decorators' Convention	12	Legal	24
Proceedings of the Annual Convention O. A. A.	13-14-15		

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" A. F. DUNLOP, R.C.A., Architect, Montreal.
" FRED. T. HODGSON, Architect, Collingwood, Ont.

Students' Competition.

A large number of students have submitted designs in the competition for a public library building announced in our November issue. The merits of these designs will be considered by a committee appointed for the purpose by the O.A.A. and the Toronto Architectural Eighteen Club, whose criticisms and award we hope to publish in our February number.

Ontario Association of Architects.

We are only able in the present number to make brief mention of the annual convention of the O.A.A. held in Toronto on the 12th and 13th inst. Next month we hope to publish a more extended account of the proceedings, which were of a very interesting and instructive character. The excellence of the papers may be judged by the one by Prof. R. C. Carpenter, printed in this number. The address of the President, Mr. W. L. Symons, while comprehensive in its scope, dealt at most length with means whereby friction between employers and employees in the building trades might be lessened and strikes avoided. The suggestion was again made that the annual conventions should be held alternately in the leading cities of Ontario. The difficulty experienced in securing a large attendance even in Toronto offers little encouragement to make trial of the idea, which if found feasible, would be likely to widen interest in the Association and its work. The exhibition of drawings and photographs contributed by architects in all parts of Canada added greatly to the interest of the occasion. In common with our readers we are indebted to Prof. Nobbs, of McGill University, for the notes on this exhibition appearing in another column. The proceedings terminated with an enjoyable dinner at the King Edward Hotel, at which several interesting addresses were delivered by Mr. W. E. Doran, of the Province of Quebec Association of Architects, Prof. Mavor, of Toronto University, Prof. Nobbs and others.

Decorating and Furnishing.

As a natural accompaniment to the rapid increase in wealth in Canada during the last decade has come a larger expenditure on buildings for domestic use. This is particularly true as regards the interior decoration and furnishing of the house. In view of its growing importance the present number is specially devoted to decoration and furnishing. Our illustration pages show some interesting examples, while the specially written articles by well known authorities treating of various phases of the subject should add to the knowledge already possessed by our readers.

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30/9/08

TENDENCIES OF WALL PAPER DESIGN.

French Chimney Top.

Before attempting to outline the tendencies of wall paper design at the present time I should like to earnestly direct the attention of architects especially to a kindred subject, one at least inseparably connected with the decorator's work. I think I can say without exaggeration that decorators approach the work of covering the plaster walls of houses and other buildings erected of late years with trepidation amounting almost to terror as to the results. To see one's best laid plans and most cherished schemes completely frustrated by the treacherous under surface is more than disappointing. The "skin or putty coat" so much in use to impart that beautiful snowy smooth surface which so strongly appeals to some people has usually no actual adhesion to the coat beneath it and only waits the application of some material to sever its very weak connection and destroy the decorator's work. The so-called sand finish of many plasterers is almost as great a delusion. On walls thus treated many patches will be found into which no sand and very little plaster of Paris has entered—nothing but lime. Plasterers freely admit these imperfections and also that it is possible to get as good results as were obtained in houses a generation ago but they claim that current prices do not admit of the use of sufficient plaster nor of sufficient time being given to the work. Surely it is a false economy to cheapen a material which is admittedly imperfect at best, which covers so much surface and which places a stamp of dilapidation on the house out of all proportion to its relative cost to the total cost of the building. I feel satisfied that this work does not receive the attention it deserves at the hands of the architect, and that not only would the problem of decoration be greatly simplified but that the life of the plastering would be materially lengthened if honest work were insisted upon.

Another feature in the preparatory work of ceilings and walls for decoration deserves more than passing notice. I refer to the obtaining of true perpendicular and horizontal lines in the angles of the room. It is no uncommon thing to see the ceiling run from one to one and one half inches out of true in a wall of twelve or fifteen feet. The upright angles of the room are frequently as much out and in many cases meander in and out of line as they climb to the ceiling. Many rooms are two or three inches wider at one end than at the other. It can be easily understood how difficult it becomes under these circumstances to apply pattern of any sort so that it shall not appear to be leaning one way or the other. These defects are not by any means confined to cheap buildings but may be seen in some of our most pretentious structures. In almost every other trade if the work proves defective in itself it has to be made good. Why should not a guarantee be required from the contractor for plastering that his work shall successfully meet the demands made upon it in the decoration which may subsequently be applied to it?

And while I am on this portion of my subject I should like to point out what is always to the decorator at least the unexplainable practice of many architects, of carrying doors and windows in the room to two, three or more different heights. My own dining room has five such openings and every one is of a different height, varying from the others by several inches. There was no reason why the three doors at least should not have been of the same height.

The foregoing are some of the difficulties in the path of the decorator, whose remedy lies in the province of the architect. And their connection with my subject is in this. When the standard of design and the value of materials in wall coverings have advanced as they have done of late years it becomes increasingly necessary that the remedy should be applied and more perfect results obtained. The various canvasses, burlaps, denims, buckrams, etc., now manufactured solely for decorative purposes are undoubtedly great acquisitions to the resources of the decorator and are all perfectly practical on properly plastered walls. But the risk and labour of applying them to the ordinary conglomeration of sand, lime and plaster is so great as to greatly restrict their use.

Pattern has been sparingly applied to these materials partly because their own texture and coloring is quite satisfying and partly because the ordinary printing process necessitates too frequent repetition and the consequent wall-papery appearance. Block or hand printing has not been so used to any great extent though I can see no reason why excellent results might not be obtained by block printing or stencilling.

Book cloths, that is cloths used in book binding, the process of manufacture being slightly altered to adapt them to the purposes of wall covering, are sold under the trade name of Holliston cloths. The dyed burlaps and denims are too well known to need description. A Japanese material called grass-cloth woven of raw flax and dyed in beautiful tones has all the appearance of raw silk on the wall. It comes in rolls of eight yards, thirty-six inches wide. A plain paper of English manufacture called silk fibre comes in a variety of excellent colorings and has a texture much superior to the ordinary ingrain papers. These various plain materials form an important group showing a tendency to return to plain wall surfaces but with the relief of texture of one sort or another. They also call for something in the nature of a frieze to relieve the absolute plainness of the wall and although the frieze in wall paper has not yet reappeared among us, the demand has been met in England in the work of two or three men, notably Bailie Scott and Shand Kydd, the latter of whom has produced some very beautiful friezes both in design and coloring, quite individual in character and which are being extensively appropriated by other designers. On account of the amount of hand treatment in them they are themselves rather expensive. In actual progress the English designers are undoubtedly to the front. Much attention is being given in their work to the purpose for which the material is to be used. Many of the designs therefore are flat stencil effects in two tones of one color. Where varied color is used, green and blues are laid together, or greens, blues and purples, or again browns, greens and yellows, giving a pleasing relief to the eye while preserving the flat wall surface. The German designers have worked on these lines as well and their color is good but their designs are much in the extreme "new style"—so extreme, indeed, that to an ordinary mortal they are anything but beautiful. To add to their undesirability they are easily copied and have been widely copied by American manufacturers, and as is usual in such cases, the glaring faults have been accentuated under the mistaken impression that they formed the main attractiveness of the designs. The English designs are not so much in favor with the great American public and are thus saved this degradation.

To what are known as the sample-book houses and the departmental stores is due much of the cheapening of design and materials in wallpaper as in so many other lines. Something with a semblance of merit but spiced up with touches of color to catch the popular taste has to be provided at a price which will insure large sales. Thus it becomes increasingly difficult year by year to purchase designs sufficiently distinct from these meretricious vamped up piracies. Apparently the only safe course is to confine oneself to flat quiet effects in two or three tones of analogous colors and yet there are some glorious walls to be had in strong color from the collections of the leading British makers.

The French designers adhere pretty closely to their traditions in the direction of marvellous reproductions of the effect of silk, leather, tapestry, &c. As I pointed out in a former paper there is no pretense in these creations, that they are the actual material themselves, and it is therefore prefectly legitimate in such an intrinsically valueless material as wallpaper to produce any effect that will make a good wall. No objections of this sort, however, can be raised against the beautiful flocks or velvet papers in which the French excel and which have come in with the new styles or revived styles in architecture. Nothing can quite take their place in the white and gold rooms of the Empire or the Colonial of New England and Virginia.

Of the best American lines it can only be said that they are good in so far as they so closely follow the European makers as to be almost indistinguishable from them except to the trade expert. When originality is attempted it is not of an order to commend itself to a cultured taste. The craze for much display at little cost has controlled the output of a majority of the American factories.

Our own manufacturers have not yet reached a stage where the designing and coloring of their wallpapers can be seriously considered from an artistic standpoint. This condition of affairs is likely to continue for some time to come, those wishing really good design and coloring being ready to pay the difference in price for the imported lines. It is gratifying, however, to note that even in the domestic lines the showy pressed, embossed gilts, glimmers, and other such abominations have disappeared.

Some curious revivals come upon the market at times and enjoy a short run of popularity out of all proportion to their merit. An old house in Boston was pulled down the other day and on the walls of one room was exposed a panel treatment in old Chinese hand painting on small square silk sheets, the subjects reminding one of the old tea chest pictures. At once there was a demand for subjects of this sort and an enterprising importer engaged Japanese artists to produce hand painted wall hangings fifty yards long without repeat by any required width up to five or six feet. The painting was done on fine muslin with a backing of strong thin paper. Of course this revival of Japanese design is merely a fad and yet it indicates how keen is the pursuit of novelty in the decorating field.

W. H. Elliott.

PLANTS IN DECORATION.

By C. Mangold.

Who can imagine decorative art without plants? or estimate what it owes to the vast resources of the vegetable kingdom? They are so inexhaustible and so varied that they must always be its chief inspiration, and yet it has made only a very restricted choice from the wealth at its disposal. Why is this, and why at different periods have artists resorted to different plants, and why in some cases have plant-forms consituted the main feature of a design and in others played merely a subordinate part?

Te be available for decorative work a plant must not be too small, and must have a charateristic growth or a lively colour. In the earliest art-epochs of any country those plants naturally appear in decoration which are indigenous to the country, and the palm tree is thus the first plant we know to have been used, lending itself readily to the purpose, and being a native of the land which has given us the earliest examples of decoration. An artist must be familiar with the appearance and life of the plants he uses in his art, and this is only possible in the case of plants which are constantly before his eyes.

The size of a plant and its separate parts is of importance, because there are artistic limits to the representation of very small plants on a scale larger than that of nature.

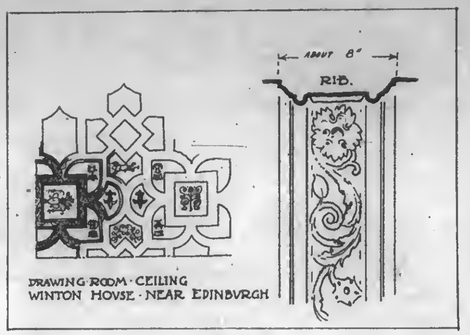
The durability of a plant is not without its weight. Not only should portions of it keep unwithered long enough to be copied, but also to make wreaths and other natural decorations. These, too, can be copied, and have at all times furnished important motives to decorative artists. In the time of the Renaissance, the use of natural floral decorations and wreaths were even commoner than now. The Italians in particular are greatly addicted to this form of decoration, and possess a large number of different evergreen plants suitable for the purpose, such as the laurel, the evergreen oak, the olive, the myrtle, and the cypress.

The choice of plants for decoration depends on the character of the nation at the time, and the fashion is always changing. We see that well in the flower representations of the present day. The vast demand for such designs for carpets, wallpapers and womens' clothes, has caused the artist to seek for inspiration from a very much greater number of plants than he has ever done before.

In many cases it is still possible to point out the particular plant from which the artist has taken his motive, but it is much more common to see fancy plants in which the mixing of types has been carried so far that the origin of the separate parts cannot be distinguished. Decorative art is, in fact, freeing itself from the trammels of precedent and striking out a new path for itself. This is as it should be, and the artist must go to nature for his novelties.—Maler Zeitung.

PLASTER DECORATION—MODELLED AND HANDWROUGHT.

Before considering a special method for the artistic treatment of a material it is as well to come to some definite conclusion as to what may be called its "genius." By the "genius of the material" we mean the characteristic kind of beauty which it possesses per se, without taking into account even the technique —the treatment which is least calculated to diminish



No. 1.

this beauty is the best. In the case of a mantlepiece of highly veined marble every member of moulding added is so much waste labour and in bad taste, for the flat or gently waved surface is alone compatible with a full realization of the beauties of the material. In white marble, on the other hand, the most delicate moulded surface will tell, and the texture of the material, too, suggests clean-cut decisive forms—the semi-transparency and light absorbing quality of white marble requires a definition of actual form which when cast in plaster appears coarse as compared with the original.

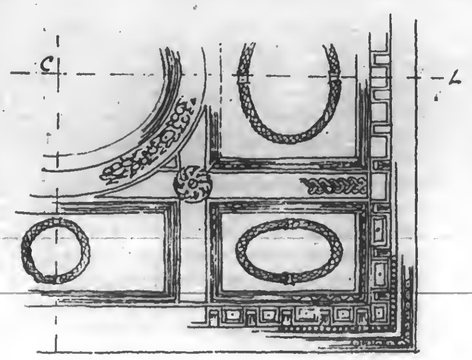
Plaster is as white as marble, but, lacking transparency, we find lights reflected into shadows and vice versa in a way no other material can rival. The most delicate or rather the softest (for delicate is apt to suggest smallness of scale) modelling will therefore produce considerable emphasis, while extreme sharpness or undercutting will show violent contrasts wholly destructive of this tender genius of white plaster. Mr. E. S. Prior has said "Plaster is the most impressionable of all materials which give architectural surface. Its response to the hand of the craftsman is sympathetic and immediate. It has not to be chiselled like stone or wood or have ideas hammered out of it like iron: a touch of the finger gives it life." Thus both the material and the technique suggest a tender treatment. We are here impelled to lodge a word of protest against the practice of painting plasterwork any colour but white and preferably lime white. To paint a cornice chocolate and pick out enrichments in gold is at once to stultify the purpose of plaster and ruin all the beauty of texture with which it is naturally so highly endowed—Where are the lights and shadows fled?

Now, considering the beginning of plaster work in England under "bluff King Hal," it was we find to Italian craftsmen that the earlier works must be attributed, but a characteristically English school soon developed. It is worth noting that much of this XVI Century work is far more plastery than what came later, though it is only within the last century that this trade has really fallen from its high place among the arts. And realizing this, there is a considerable movement among architects at home to lead the plasterer once more above the commonplaces of enriched stucco mouldings with mutules, consoles, dentils, egg and dart and all the rest of the sharp edged truck with which many a modern classic building is besmeared.

The type of these earlier ceilings is shown in our illustration from Wintoun House—the rib with moulded edges and enriched soffit divides the ceiling into geometrical panels in which occur a collection of ornamental motives of all sorts— heraldic devices, masks of mythical kings, conventional floral designs, initials, etc.

This type gradually gave place to the more formal corniced and coffered arrangements with the great circular garlands in which Inigo Jones and Wren delighted. In the earlier work the mouldings are more true to the "genius of the material," while in the later efforts the modelling reaches a very high standard though over inclined to naturalism.

In your Elizabethan ceiling the rib enrichment is usually cast, some running pattern of vine "with bunch and berry and flower through and through," while as often as not the panel motives are modelled "in situ." In the Georgian work also the great garlands are very often hand wrought "in situ." It is in the intervening debased period (and there is a world of inspiration in the work of debased periods) that we find a technique in vogue which combines the cast with



¼ PLAN OF CEILING OVER STAIR.
AT COLESHILL HOUSE BERKS.
BY INIGO JONES
AD 1650.

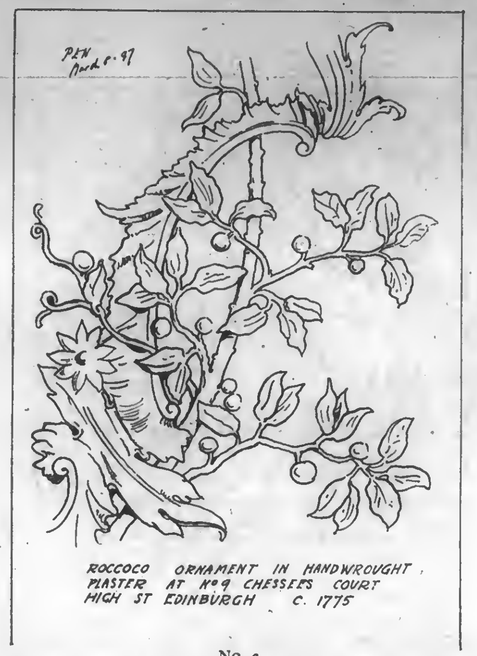
No. 2.

the hand wrought methods and which has this to commend it to a commercial age, that no other kind of ceiling decoration will give so fine an effect for a given outlay of skill and labor.

Before considering the mixed process which is our subject, a few words on the relative advantages of hand wrought and cast work may be of use.

It is the great advantage of hand wrought work that it can be done "in situ." Lighting is an all important question in plaster modelling, while the only way to

get a decoration the right size is to execute it in its place. To execute hand wrought plaster in the shop and then fix it is a very futile proceeding. In hand-wrought work we get the additional value which attaches to the unique. Though a good thing wil stand repetition while a bad thing is none the better for



ROCOCO ORNAMENT IN HANDWROUGHT PLASTER AT N°9 CHESSES COURT HIGH ST EDINBURGH C. 1775

No. 3.

being the only case in point, still it is nicer not to have the stereotyped ornament we know exists in the shop round the corner and in the house where we dined last night, right in our own parlor. Moreover in hand-wrought work balance takes the place of repetition and between the value of balance as an ornamental basis and repetition there is a great gulf.

Handwrought work can never be so perfect as cast work owing firstly to the speed with which it has to be modelled while the material is setting, and secondly to the impossibility of using wood tools or fingers. To the former the lime or cement adheres while the latter are burnt. The use of metal tools is the reason why one does not see modern handwrought plaster with a truly modelled surface; it looks like sketchy carving. The men of old time used to slake their lime for years and mix it with all manner of strange ingredients to render it plastic and slow, and we can only regret that this is not now commercially possible.

Now the dreary monotony of themes of plaster decoration depending on quantities of cast detail is patent to all who give the matter a thought, though for enrichments of the right sort and running repeats, etc., casting can never be dispensed with.

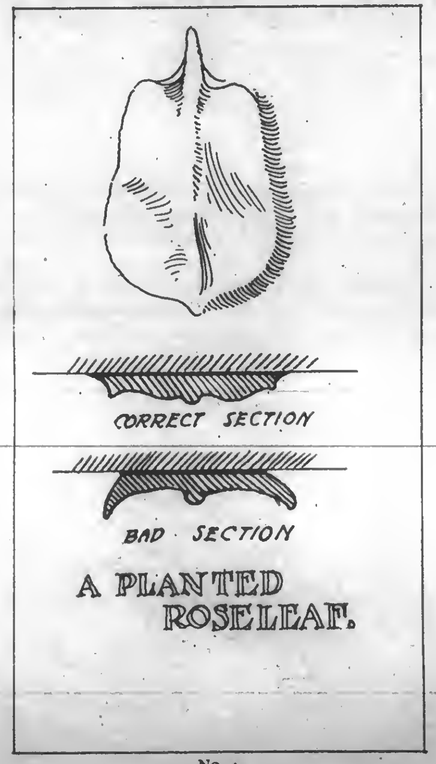
From the above we think it might be inferred that an ideal kind of floral plaster decoration would consist in having parts modelled in clay and cast and parts modelled in situ, thus ensuring a delicacy in the leaf, flower and fruit work while admitting of the utmost freedom of arrangement and stem modelling with regard to lighting and variation. Such a process we find in use in the latter half of the XVI century, and it seems quite to have fallen out of favor till some domestic architects at home by making measured drawings of old plaster work discovered that leaves and fruits supposed to be hand modelled were all of a pattern, a fact that would never be guessed from the ground, because each leaf taking its light at a different angle presents a different aspect. This little deception is the only "trick" in the particular branch of the trade.

This method lends itself particularly to the covering of large surfaces such as ceilings; coves or domes with a varied enrichment of surface, breadth being well assured by the family resemblance of the items modelled and cast, while any degree of richness can be attained by a closer or wider spacing of parts.

I have seen a vine treated happily enough with only one type of bunch and leaf, but in my own experience several types varied in size have been used.

It is worth while to note what the section of plaster leaves should be with regard to the surface of the ceiling or cove. The illustration shows this and I need only say that the section advocated will make the ornament look a part of the ceiling, not something to be knocked off.

Now to describe the process of doing a ceiling



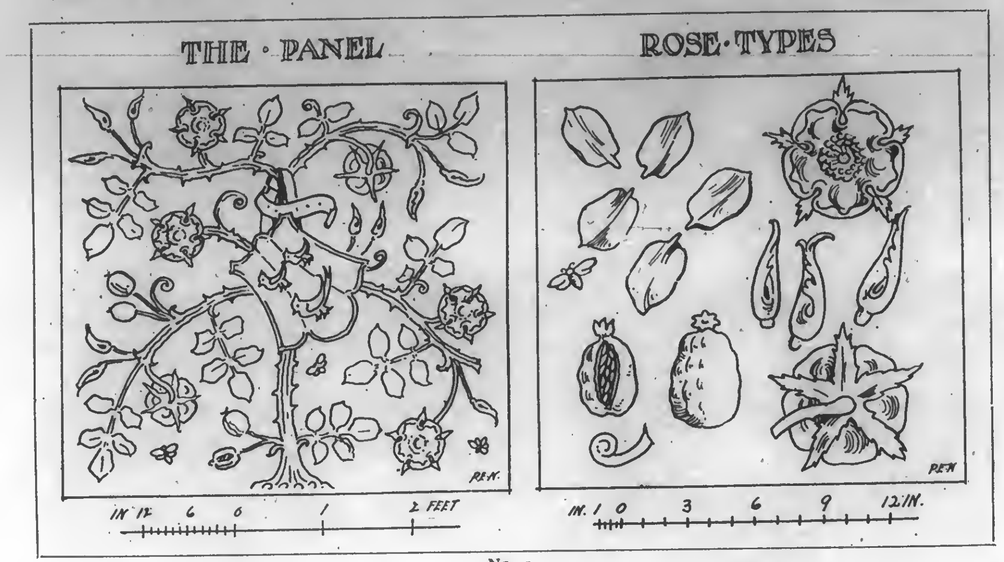
No. 4.

in this way. Let us suppose our types or items have been modelled, and the number of each that will be wanted having been calculated, they are cast and ready in baskets. They may be for vine, or rose, or lily, or oak, or maple; they may be stiffly conventional, severely correct to some recognized style or free to the verge of naturalism. In a word they may be as their designer

fancies. Next the scaffold is mounted and the dispositions set out in blue pencil on the plaster. Stems, wreaths, ribbands to be hand wrought being carefully thought out, while the positions for leaves, fruits, shields, or inset subject panels may be marked and numbered.

In disposing the stems care should be taken to avoid great curves and violently assertive scrolls, as this type of decoration aims rather at enriching surface in a subordinate spirit than at distracting the attention, and there is nothing like a strong bold curve for catching the eye.

The modeller then goes up and fixes his leaves and flowers, breaking the ground to form a key, and flushing up smoothly round the edges with his Parian Cement,



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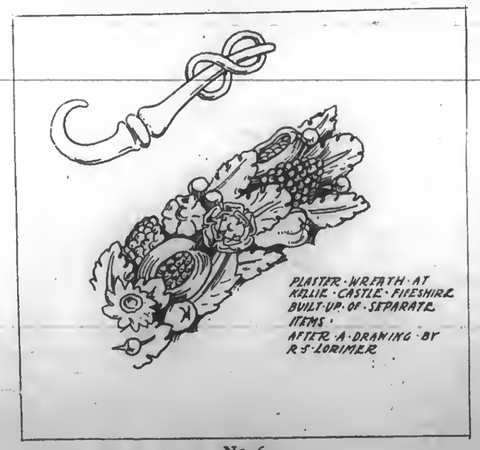


No. 6.

in which material slowed down with lime, he will also execute the stems, &c. Give him a bit of vine branch or a thorny rose stem and try for a good conventionalization of it. The twist of the vine and the thorns of the briar are easy characteristics to grasp.

When subject ornament is cast on the flat for insertion it is well to run a bead round the joint or to recess the plate in the ceiling. Plaster of paris and lime are not quite homogeneous in texture and the joint on a flat side-lit surface will show unpleasantly unless frankly acknowledged.

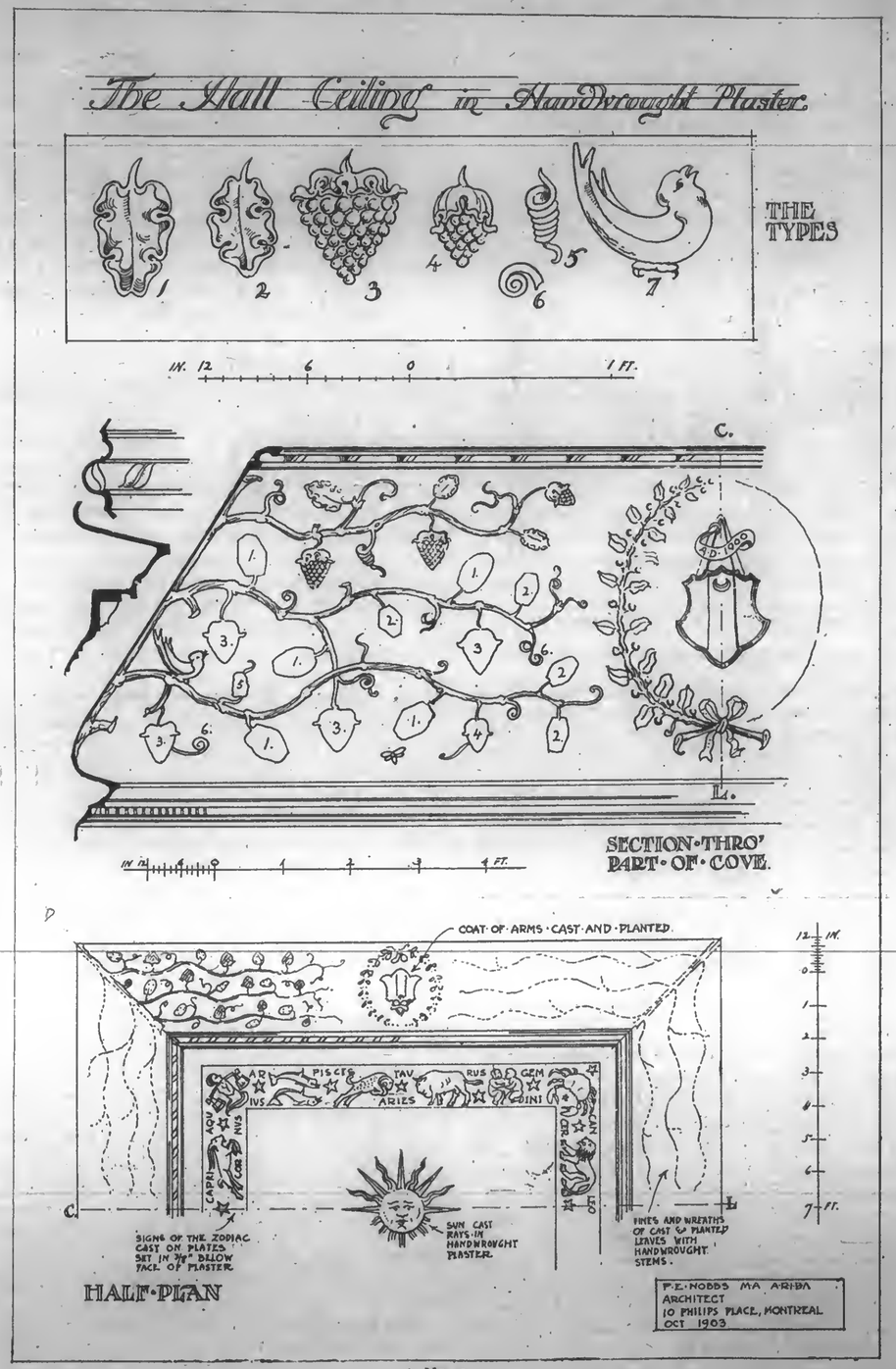
In making up the great circular garlands so characteristic of English XVII century work a process analagous to the above was often used. Berries and fruits are attached with string to nails driven into the hollow bed while soft, larger fruit and leaves being pegged or merely cemented on. In garlands so made up there is often a certain crudeness of composition, but they are far more likely to be rightly conceived as to scale and proportion than when the garland is cast in lengths to repeat while this last attribute is happily lacking. Compared with garlands hand wrought, in parian cement, these have the advantage already pointed out of lacking the carved out and sketchy feeling natural to quick modelling in a hard setting medium.

As an example we publish a design for a small coved ceiling with details and notes which may be of interest as an attempt to revive old methods.

To sum up the advantage of this old method of plaster decoration, we have seen that the amount of highly skilled modelling required is not very great. Half a dozen types will do for a large job. The stem modelling can be easily taught an intelligent workman. Any degree of conventionality or naturalism can be obtained which is desired and also any degree of richness or simplicity. The decorations are designed "in situ," an advantage quite as important as their being so executed.

With regard to plaster ceilings in general we would say that this is preeminently one of the cases where restful enrichment is called for and it is time we ceased securing this by the employment of forms which only fail to distract on account of their wearysome familiarity or conspicuous lack of beauty. Nothing in a ceiling should assert itself at the expense of objects on the walls or the furniture, but a ceiling need not on that account be wholly dull and lifeless.

PERCY E. NOBBS.



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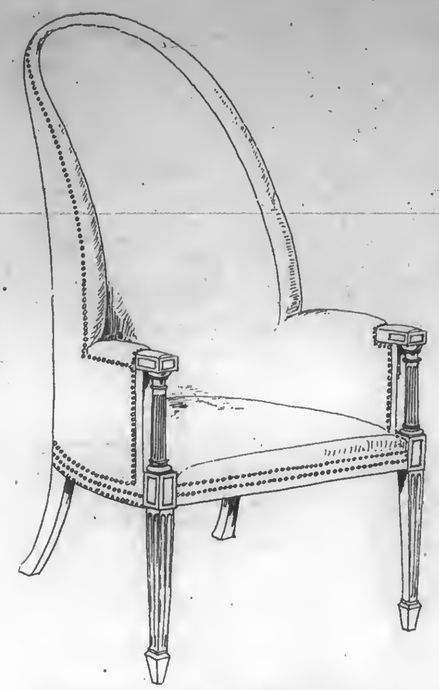


An Old Colonial Chair Used By Washington.

HOUSEHOLD FURNITURE, OLD AND NEW.

Architecture has frequently been called the mother of the arts. The laws which govern the designing of decoration and furniture are closely related to those which govern the building art. The greater art encloses the lesser.

In the work-a-day world we can hardly imagine a successful designer of furniture, without any knowledge of architecture. And those who have this knowledge primarily, before taking up the designing of decoration and furniture have an immense advantage over their fellows in the grasp of general principles and sense of fitness. Let it not be thought that the architect can drop his architectural work one day, and the next day blossom out as a full fledged furniture designer. In every art the technique has to be learnt, an apprenticeship has to be served.

The designing of such pieces as cabinets, bureaus, drawers and bookcases, naturally comes easiest to the architect, whilst the designing of chairs will be more difficult to master. Indeed the designer who can turn-out a chair that is at once the acme of beauty and utility, comes nigh to perfection in the art of furniture designing.

If we were asked to define in one word the measure of the highest art and skill in this branch of applied art, we should unhesitatingly say, "proportion" first, last and always, proportion. The balance of solid to void of curved forms with straight forms, and so on all through the gamut of form, and color also, if varied color is employed on the object.

Twenty years ago, the writer, having served an apprenticeship of twenty years to the art of architecture, entered upon another apprenticeship to the art of furniture designing, in which he still continues. These notes are largely the cumulative result of his experience during that time.

In the year 1883, Richardson the architect of Boston, was in the zenith of his power. The influence of his style pervaded furniture also to some extent. A revival of "colonial" work had also then set in. To-day Richardson's influence is dead, but the "colonial" revival has grown and broadened. The art of England of the eighteenth century is to-day in the ascendency and almost paramount in its influence. This has not come about wholly as a mere fashion, such as affects our dress, but rather as a matter of selection; we have sought those old types because we found they suited our mood and the thought of the day. Moreover we found them comfortable and pleasing to the eye, and last of all they have saved us the trouble of much thinking for ourselves in these hurried times.

It cannot be denied that the desire to possess old furniture as home furnishing or to copy direct from old examples has been inimical to the progress and development of original design.

It must be dampening to the ardor of a designer, brimful of new ideas, to be told by one patron to copy an old chair, the property of another patron. Occasionally this is done without as much as asking the owner's permission, amounting to a barefaced act of piracy.

While the current trend of late years has been more and more to copy from old examples there has recently been evolved a freer style known as L'Art Nouveau. This undoubtedly sprang from the first work of the Arts and Crafts Society in London. The French and Germans caught the prevailing new ideas until now we have travesties of the originals and things produced that might be appropriately called "nightmares" of design, worse in form than the most debased rococco work of the Louis XV period. A reaction from this towards simpler and severed forms will assuredly follow.

With the second half of the eighteenth century a change in the prevailing style of English furniture set in. Sir William Chambers, R.A., an architect, and later Robert Adam, another architect, designed furniture. Many of the latter's designs were carried out by Gillows, a firm of furniture makers still in existence in London under the name of Waring Brothers. Chippendale, Hepplewhite and Sheraton were designers and makers of furniture, whose names have become associated with the work done in England during this interesting period. Robert Adam, who had travelled in Italy, shows in his work the influence of Pompeii and Roman architecture. One of the most beautiful examples of furniture belonging to this period is a dressing table of satinwood with painted decoration, in the South Kensington Museum (see illustration pages). Towards the end of the eighteenth century satinwood from the East Indies came into use in England. It soon became a favorite wood for pieces which were decorated with color.

There were several artists who had come to England from Italy who were employed in decorative painting on panels of walls and ceilings, and who also painted decoratively cabinets, tables and chairs. Sometimes a darker colored wood was used for oval medallions, on which were painted figure subjects classical in character. This contrasted well with the surrounding yellow color of the satinwood.

Pergolesi, Cipriani and Angelica Kauffman were employed by Robert Adam, the architect, in decorative work. The painting on both of the dressing tables illustrated is the work of the last named artist, who was one of the two lady members of the Royal Academy at its inception.

The satinwood chairs of this period are particularly fine, being comparatively simple in form and free from much molding or carving as objects decorated with color should be. The time is known as that of Sheraton and Hepplewhite, although there were many other makers of furniture who worked in the same style. Both of these noted makers published books with designs for furniture.

For drawing rooms, boudoirs and bedrooms where enrichment is desired, this treatment of color decoration on satinwood or mahogany seems particularly appropriate. Other woods besides those named may be used provided they have a beautiful figure or grain; for painted decoration needs this by way of contrast, as a background, which should have enough glossy polish to bring out all the natural beauty of the wood.

In our workshops we have not as yet exhausted the possibilities and variety of colors to be obtained by staining woods, which is a perfectly legitimate method of obtaining artistic effects in furniture.

The proper treatment of such fine grained woods as Mahogany and Satinwood is to leave broad surfaces to display their beauty when polished just as we treat marble, and not to introduce much carving. On the other hand such woods as oak which are of coarser fibre lend themselves to more ornamentation and are suitable mediums for a liberal amount of carving.

Oak should never be left its natural color in the process of finishing. There is no reason why the mellow colors which oak assumes through age should not be imitated, in order that a more pleasing harmony of color may be obtained in the room, and to avoid the rawness of natural color. Some of the best effects are the result of staining only, with little or no shellac, leaving an unpolished surface. The process of staining oak by fumigating with ammonia is much practiced in England, and often fine effects of rich brown colors are obtained by this process.

The wood known as English Brown Oak is sometimes used along with the ordinary Red or White American oak in panels. The variegated figure of the brown oak contrasts well with the native oak which is stained to match it in color.

Prima Vera, generally known as White Mahogany, is sometimes used as a substitute for Satinwood. It has not the same beauty of surface, but it takes a stain well, and can be finished the same color as satinwood.

The woods most in favor at the present time for furniture making are mahogany and oak.

The difference in quality of workmanship and design, between the ordinary work of our day, and that of, say a century and a half ago, is largely due to a lack of special artistic interest in furniture generally and the extensive use of machinery.

The wholesale multiplication of elaborate pieces, nearly all machine made, robs the work of its individuality and takes the very soul out of it.

The whole traditions of the craftsman which were formerly handed down from father to son are lost. The thing produced has no longer any human interest for us. Machinery has its uses but it can never take the place of human thought and human feeling. Not infrequently it happens in these days of rampant commercialism that an excellent design for a piece of furniture is simply killed by altering the artist's working drawing so that the handwork is wholly eliminated. The machine does every part, the result being a machine product which may serve its purpose but never can be wholly satisfying to our artistic sense which craves beauty.

How then are we to obtain the highest and the best results in the making of furniture? I am inclined to think we will have to return to some at least of the good old ways, when the cabinet maker was more of an artist and a craftsman than he is now. We must not let machinery run away with us, and think we can turn out satisfying work by making a gross of pieces at a time. Chippendale and his immediate successors when they set about making chairs, did not consider how they could save seventy five cents on each, by getting a machine to do the work of the carver. If they had followed such a plan their work would not have lived ten years after them. No, it is the human artistic quality after all that gives the lasting value to everything we use. Therefore I say have things specially designed by an artist if you can afford it and made by a craftsman, and pay each a just price for their work.

I have often observed how the young architect when about to marry sets about the furnishing of his house. Most likely during the engaged period or before, he has been picking up at random, odd old pieces in his rambles here and there. Perhaps a four post Colonial bed, a bureau, some mirrors and a few chairs will be in his collection, and it is astonishing how easy it is to furnish rooms with such things.

Whatever else is needed he frequently designs for himself, often of the simplest form (as befits his slender purse) such as a clean carpenter can make. Instinctively he avoids the furniture "slaughter houses." Whatever things modern he may buy, he exercises with good judgment the spirit of selection.

In selecting or designing furniture for his clients the architect will be safe in following out generally a somewhat similar plan, modified and governed of course by the money available for the housefurnishing. The best results are not always attained in those houses where money has been lavishly spent. To design richly, to use costly materials, is often more trying to the architect or designer's skill and judgment, than in work where very limited means are at his disposal.

There is no doubt whatever that, with the rapid growth of Canada, with the Dominion's increase in wealth, a time in the near future will soon come when Art—and that of the very highest kind—will be discriminatiny called into service to beautify the homes throughout the land.

Robert Brown.

ODE TO AN ARCHITECT (?)

(CONTRIBUTED.)

When 'Omer smote 'is bloomin' lyre,
He'd 'eard men sing by land and sea;
An' what he thought 'e might require,
'E went an' took—the same as me!

The market-girls an' fishermen,
The shepherds an' the sailors, too,
They 'eard old songs turn up again,
But kep' it quiet—same as you!

They knew 'e stole; 'e knew they knowed.
They didn't tell, nor make a fuss,
But winked at 'Omer down the road,
An' 'e winked back—the same as us!

—Kipling.

L'ART NOUVEAU.

A new movement in art is worth looking at with respect in the first instance. It is usually a reaction from some artificial state that wants reformation, and the new movement may be regarded as a protest. L'Art Nouveau seems to be a phase of this kind.

As far as can be made out from occasional illustrations, there is one "feeling" running through it all, and this may be roughly described as a feeling for freedom. Always supposing that art is possible at all under conditions of freedom, what is it they want to be free from? The worst examples appear to want to be free from everything, and would probably be brought by its authors under the sentiment of "art for art's sake," which has a noble sound, but about as much sense as "a stick with one end." It makes one's brain crack to try to think of Art existing by itself and for its own sake. It is impossible to conceive of Art except as concerned in the making of something; and Art consists in making it properly. Over what makes proper making the battle may rage, but it has got to be all

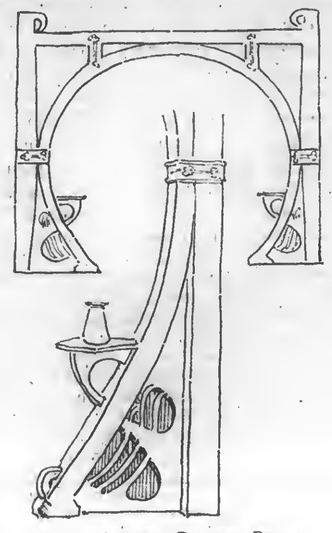


FIG. 1.—ARCHWAY BETWEEN ROOMS.

about making; that is to say an artist's work must represent the purpose for which it was made as exactly as a machinist's; and therefore that part of the new art, that aims first at being unrestrained is not likely to go far towards any purpose the New Art movement is serving in the history of art.

The essential peculiarity seems to be form without reason. The designer in all probability thinks that beauty of form is an abstract quailty. Is there not a "Line of Beauty" over which Hogarth took a lot of trouble? There is; but it does not appear anywhere in a Greek temple. There are evidently circumstances which modify the application of abstract curvature to building. It does not require much reasoning to know that the worst manifestations of the New Art are wrong; the eye is sufficient. A room abandoned to its utmost effort (many such are shown in the German journals) is perhaps the most unquiet thing ever yet produced in the way of architectural finish; the whole room is writhing; it is like nothing so much as being at the bottom of the sea amid the sinuous seaweed. Examined in detail the trouble appears to lie in shaped wood—not square stuff but boards. This is always an unpleasant kind of work; enjoying the distinction of being both heavy and trifling, even when it serves a recognizable construction function; so that it is anything but pleasing to find it done for its own sake, unreasonably. An evidence of the unreasonable character of German Art Nouveau curves is the prevalence of the horse-shoe, the type of the fantastic in architecture; a form which is sure to give a character of superfluousness, even when the opening arched in this way is of brick or stone and the greater part of the form is constructive: when it is shaped out of boards and makes an arched opening between two rooms, as frequently appears in German drawings, the force of Art for Art's sake, can hardly, one would think, go much further. If there is no other reason against it, imagine the danger to which a gentleman would be subjected when,

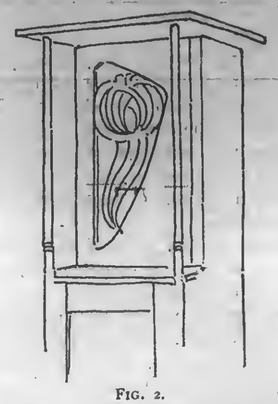


FIG. 2.

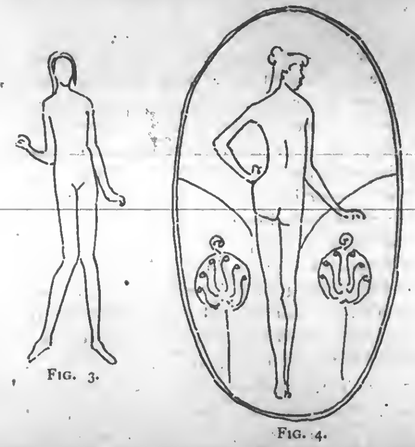


FIG. 3.

FIG. 4.

giddy with the writhings of the trimming, furniture, and wall decoration of one room, he attempted to pass into the next, through an archway which is 6 feet wide at the level of his eye but only 4 feet 6 inches on the floor.

The door of the cabinet in Fig. 2, is a good illustration of the result of letting the wayward fancy roam. This is an extreme case perhaps, but there is nothing like an extreme case to show the way things are tending, and it is rather interesting that the same volume gives a couple of pieces of wall decoration, which seem to show that the influcnce of freedom and the

jig saw are felt in the conception of the female form. This is truly new art. Representations of women are usually said to be either intellectual or sensuous; but here are figures which are neither.

In its more moderate form the shaped board style of work is shown in such forms as the door architraves

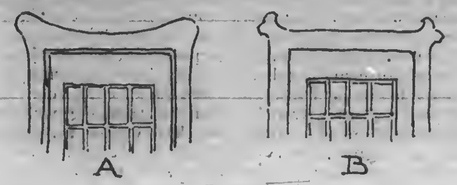


FIG. 5.

in Fig. 5. It is evident that the feebleness of A can only be corrected by the br tality of B.

There is no life in this sort of effort alter shape for shape's sake, and when people to whom fashions in art serve the same purpose as a poster—something to attract attention for a while because it is new—find it has served its purpose, this branch of the New Art will fold its tent like the Arabs and silently steal away.

Of the same order as this amorphous shaping of material are the French statues growing out of a crude block of marble, and their unconfined architectural carving and flowing lines of moulding. It is all apparently at bottom a reaction from the conventions of classical architecture, and the mistake made is in confusing with the conventions of style conventions which are essential to satisfactory expression in all building; in rejecting both the prevailing horizontality of classical architecture and the use of the mouldings by which it is expressed; in avoiding right lines altogether or making them run the other way. Mr. Voysey, whose own work is allied to reactionary ideas, complains in an article of the excess of verticality.

Gothic architecture may be vertical in feeling but there is nothing sits so well upon the ground; its masses take care of that both in plan and structure; in fact, as a school of design which was essentially structural, it could not do otherwise than express, by the facts of its construction, the law of gravity which is the basis of building. The conventions of classic architecture express the same thing in an abstract manner, emphasizing for the greater satisfaction of the eye its repose under a law of which we are always unconsciously conscious. If the New Art wants a change, it must devise a new convention on the same lines, or else a new law.

It is quite otherwise when it comes to movable furniture. Here the freedom of the New Art scores over Michael Angelo; for such furniture is not building but joinery. Its conditions of stability are not vertical pressure. Its tenons are fox wedged or pinned, which give its joints tensional strength; or glued, so that their strength comes from suction, due to the pressure of the atmosphere, which follows the law of fluids, pressing every way. Furniture is made to be both lifted and loaded, and its construction has various tensions to express as well as vertical resistance. The joints are therefore absolutely devoid of expression and to ignore them is the proper policy. The grace of Colonna's furniture, shown in illustrations of the Maison Bing in the Studio and Architectural Record, is mainly due to the vertical and horizontal lines, both of which are severely simple, meeting with a slight curve. This does not at all express the joint, which comes somewhere in the curve; but it is exactly the right expression to the eye of the perfect union of the work at the joints; the union of parts in an article which is intended to be moved. The same thing may be expressed by a projecting tenon and pin; but the "honesty" of this work is not carried far enough; if it proclaims itself movable it ought to be so, but it usually is not. Colonna's furniture is light and its expressiveness is more delicate than in the furniture of our rude (and strong) forefathers. The joints (to return to them) are emphatic points in his design, like the corners of a picture frame, but no more. He usually emphasizes them still further by knots of carving which are not intended to be read, as it were, in one direction but are worked over the joint.

To sum up, because it is time, not because the subject is fully treated:—l'Art Nouveau has probably arisen as a reaction from the over rigidity of system in classical design. But the reaction is everywhere; the New Art is but one phase and for the most part not a very good one. There is as much reaction in Mr. Belcher's Institute of Chartered Accountants as in the greatest vagary in Paris; it is just as much alive as any piece of New Art and likely to remain alive much longer.

W. A. LANGTON.

HEATING AND VENTILATION OF BUILDINGS*

BY R.C. CARPENTER, Professor Experimental Engineering; Cornell University.

In the time which can reasonably be devoted to a consideration of this subject, only a few elements relating to the important art of heating and ventilation can be diseussed. I have selected consequently certain phases of the question which I believe would be of interest to architects and which I thought would lead to a practical and valuable discussion.

TEMPERATURE REQUIRED.

The requirement for heating varies in different countries and under different conditions so that propositions and rules are very rarely of such a general nature that they can be applied without some modification due to surrounding conditions. On the continent of Europe 15° Centigrade, corresponding to about 59° Fah., is considered a comfortable temperature; in America it is the general practice and custom to maintain a temperature of 70° Fah. in dwellings, offices, stores and most workshops, and a heating apparatus is considered inadequate which will not maintain this temperature under all conditions of weather.

EFFECT OF MOISTURE.

The lack of moisture in the air is in a large measure responsible for the demand for such high temperatures in our inhabited rooms. In buildings warmed without an additional supply of moisture, the relative humidity becomes very low and as a consequence the air develops an excessive greediness for moisture and a capacity for drying out all furniture and removing all moisture from bodies with which it comes in contact. Outside air usually contains from ½ to ⅔ the amount of moisture required for saturation and as a consequence it exerts only a slight influence in evaporating fluids from the body or from other materials. This same air if warmed to any considerable amount develops a great capacity for absorbing or evaporating more moisture and as this evaporating process is one which removes heat from the human body, it no doubt accounts for the demand for a hot room provided it contains dry air. This is well illustrated by a consideration of the capacity for holding moisture by air at different temperatures. Thus, one cubic foot of air at a temperature of zero is saturated by .56 of a grain, while air at 70 degrees temperature requires very nearly 8 grains to saturate one cubic foot. This indicates that if air of zero degrees temperature be drawn into a room and warmed, nearly 7½ grains of moisture per cubic foot must be added to maintain it in a saturated condition, or about 3¾ grains would be required to maintain its relative humidity at about 50 per cent. of the saturated condition, or say in a comfortable condition. Since 7000 grains make one pound, this calculation would indicate that more than one pound of water must be added for each 2000 cubic feet of air introduced in order to maintain the room in a comfortable condition so far as the degree of humidity is concerned.

In respect to the supply of moisture to our warmed rooms, all our heating systems are deficient and until

*From Heating and Ventilation, N. Y. John Wiley & Son. (4th Edition)
†Paper read at the annual convention of the O.A.A., Jan., 1904.

very recently little attention has been given to the matter. As a result, most of us are accustomed to live in houses which have an atmosphere dryer than the air of the dryest desert, which air tends constantly to draw, by a process of evaporation, moisture from the bodies of the inmates which on the other hand produces a feeling of chilliness and discomfort that can only be overcome by an extremely high temperature. I believe that this fact accounts for the habits already pointed out, viz, that we require higher temperature in order to be comfortable than the inhabitants of Europe. I believe in this respect, too, the residents of Canada will be found to live in even a dryer atmosphere than that common in the States and as a result they require a higher temperature in order to be comfortable. These considerations point out the importance of supplying the proper amount of moisture to our heated rooms. There is little doubt but that a proper degree of humidity would result in a decided saving of fuel and would probably improve our sanitary conditions.

NEED OF VENTILATION.

Systems of warming with and without ventilation exist in large numbers; those without ventilation being greatly in excess of those with. A system of ventilation is frequently regarded as a luxury which is only applied where sanitary conditions are such as to make it absolutely necessary, but systems of heating are so essential to a comfortable existence and even to life itself that they must be installed in practically all inhabited buildings in these latitudes. Systems of ventilation are not so vitally essential to the human existence especially if the health be disregarded, for it is a fact that people who are unaccustomed to pure air may be very comfortable in air which is charged with organic organisms and various deleterious gases; the effects, however, of breathing impure air, while not producing sensible uncomfortable sensations, are much more serious than living in cold rooms. It will doubtless require argument and persuasion to induce people to install a proper ventilating apparatus, since such apparatus adds both to the first cost of the construction and the operating expense. It costs money to warm buildings; it will cost additional money to properly warm the air which is needed for thorough ventilation. Considerations of comfort require the building to be warm, sanitary considerations require the building to be ventilated. If people could be made to feel that the cost of ventilation was a better investment than the cost of a physician, there would be no lack of pure air no more than there is of a high temperature in our present buildings.

The greater part of our buildings are heated by some system of direct heating especially when steam or hot water are employed as the heating medium, and in such cases the only ventilation which we find is that accidental ventilation due to the entrance of air around door and window frames or that which enters when doors may be opened as people pass to and from the room. In dwellings where only a few people live, systems of heating may exist with good sanitary conditions, but where a large number of people use the same room, additional air must be supplied, otherwise the sanitary conditions will be bad and the effect on the health of the inmates will be serious.

HEATING IN CONNECTION WITH VENTILATION.

While large supplies of air may be drawn in to a room by a heated chimney, such a system of heating air is not economical nor is it at the present time very extensively used. When air is required for ventilation it is at the present time generally supplied by a pressure blower which is so arranged as to force the air over a heating surface on its journey to the room so that it will enter the room without causing the inmates any sensation of chilliness. The systems of heating in which the blower is employed for delivering air into the room vary in character; in some of these systems the entire heat required for the rooms is brought in by the the entering air which is forced over a heating surface and warmed sufficiently to accomplish this result; in other systems direct radiation is placed in the rooms to be warmed and the entering air is heated only to a point necessary to remove its chilliness which is usually a few degrees above that of the required temperature of the room. In some instances the entire heating surface for a building is massed in one place and the air is forced from this location to all the rooms; in such cases means are usually provided for by-passing the air around the heater in case the temperature becomes too high, arrangements being introduced for supplying a constant volume for ventilation purposes regardless of the demand for heat; in other cases the heating surface is subdivided in small parts and the air for each room is warmed separately from that for the remaining portion of the building. In carrying out these various systems, heating engineers have shown great versatility and great adaptability; in a few cases they have been prevented from producing the best results because of lack of space in the building and because the architect did not have an intelligent idea of the work necessary. It is perhaps unnecessary to mention that ventilating apparatus requires room in order to meet all the requirements of modern sanitary science and this room should be located with judgment and so as to permit of the proper erection of what are essential features of modern sanitary construction.

RELATIVE ADVANTAGES OF HOT WATER AND STEAM HEATING SYSTEMS.

In systems of heating by hot water circulation, the heated water rises and the cooler water falls by reason of difference in weight; in many respects a system of hot water circulation is an ideal one; this is especially true with reference to temperature regulation for if the radiators are properly proportioned the temperature of the radiator may be modified or regulated by the supply valve so as to maintain any desired temperature in a room. This advantage is also an economical one when the weather is moderate and as a result it is generally found that hot water heating systems require less coal than steam for an entire season's heating.

Steam heating surfaces can be made much smaller than hot water surfaces for the reason that the temperature of steam can be made considerably in excess of that which is practically possible with hot water radiators. They are open, however, to the objection that the temperature of the radiator cannot be changed by varying the opening of the supply valve, so that in order to regulate the temperature in a steam radiator the steam must be alternately all turned on or all turned off. It is, of course, possible by manipulation of the air valve to render some of the heating surface in a radiator inoperative, and this makes possible a method of regulation which, while effective, is exceedingly troublesome for the reason that it is dependent upon constant manipulation of steam and air valves. Practically, however, the temperature of radiation in an ordinary system of steam heating can only be regulated by turning all the steam on or all the steam off.

Steam heating systems are less costly than hot water heating systems since the radiators are only about five-eighths as large, and the radiators of such systems are less conspicuous and generally more desirable.

VACUUM STEAM HEATING SYSTEMS.

During the last few years many improvements have been made in steam heating systems with the intention of overcoming the defects and of making the system of steam heating in every respect as desirable as that of hot water with the additional advantage of using smaller and less conspicuous radiators. It is a well-known fact that, as the atmospheric pressure is diminished, water will boil at a lower temperature, or, in other words, steam formed under such conditions would have a lower temperature than that formed under atmospheric pressure or one higher than atmospheric. It follows from this, then, that if the pressure in the apparatus used in steam heating can be varied to suit the requirements for a higher or a lower temperature, we can obtain in a steam heating system all the advantages pertaining to the present steam heating apparatus for cold weather and all

those which pertain to the hot water heating apparatus for mild weather. Such a system in order to be successful would be operated when the weather was cold at atmospheric pressure or slightly above, in which case the temperature of the steam might vary from 212 deg. to 220 deg. Fah. With a milder temperature pressures lower than atmospheric could be had provided the atmospheric pressure were nearly removed from the system, in which case we might have a boiling temperature and steam corresponding to the pressure which would vary from 150 deg. upward. In the Paul, in the Webster, and in the Johnson system the vacuum is produced by an independent air pump which removes mechanically all the air from the system. In the Morgan system and several similar ones the air is removed through a mercury trap by applying pressure for a short time to the entire system, arrangements being used which prevent the air from entering after it has once been driven out.

The first three systems referred to are evidently positive in their methods of operation and have proved to be eminently practicable and satisfactory in the heating of large buildings where power is available for removing the air. The Paul and also the Webster system is eminently suited for the use of exhaust steam since each provides practical means of circulating exhaust steam without the addition of back pressure on the engine. The use of exhaust steam for heating very frequently permits the saving of large quantities of coal, for the reason that exhaust steam which would otherwise be wasted may frequently be made to answer every requirement for heating, without the necessity of burning additional coal.

Large buildings which are constructed for office, dwelling or factory use usually contain steam plant for elevators or other power purposes. The exhaust steam from such a plant may frequently be sufficient for warming the building during the cold months and should if possible be utilized for that purpose. The Paul or the Webster systems can be installed without the expense of pipes of extra large size and in this way present an opportunity for great improvement in economy of fuel and in obtaining satisfactory results at much less cost than the older processes.

The vacuum systems without the use of power devices for removing the entrained air require excellent workmanship, but if properly installed are very satisfactory and will produce excellent results.

IMPROVED HOT WATER SYSTEMS.

Some attempts have been made to improve the heat carrying capacity of hot water by adding some substance which would decidedly raise the temperature of the boiling point. While such substances are known, the cost at the present time is too much to preclude any extensive commercial use. If we could raise the temperature of the boiling point of hot water without increasing the pressure, smaller radiators could be used and the objections to that system which now exist would be entirely removed.

Among the chemicals which are found well fitted for use in a hot water heating system, the chloride of calcium is perhaps the most prominent. Its expense would, however, prevent its extensive use. Common salt (chloride of sodium) is entirely unfitted for such a purpose for the reason that it rusts any iron material with which it comes in contact.

Hot water has also proved to be an admirable medium for use in connection with exhaust steam heating; for such uses the hot water is circulated by a pump and is warmed by passing through a metallic heater so arranged that the exhaust steam comes in contact with the outer surface of a series of tubes and the water to be heated comes in contact with the inner surface. This system has been applied by Evans & Almirall of New York to the heating of large establishments and small towns and has proved admirably adapted for such purposes.

High temperature can be obtained in hot water heating systems by omitting any expansion tank and closing off any connection with the external air; such a system being known as a high pressure system. Such systems have been frequently installed but they are exceedingly dangerous, for the reason that the pressure increases as the temperature is raised, with the result that unless appliances for protecting the apparatus be installed and maintained in perfect order, a pressure sufficient to cause an explosion is likely to be produced. I cannot too strongly argue against the use of a pressure system of hot water heating for the reason that I think it is too dangerous to be seriously considered as a possible means of heating. Happily, I believe that this system has been pretty nearly abandoned both in Canada and in the United States, although I have recently heard that a system of hot water heating has been employed in Canada in which valves were used in the return pipes and located in such a manner that they could be closed during the operation of the heating system and in fact were so closed, the effect being to produce an over pressure and a serious explosion. This calls attention to the need in all hot water heating plants of constructing a circulating system so that it cannot possibly be obstructed either by accident or otherwise.

HEATING WITH HOT AIR.

Heating by hot air circulation or from a furnace which is located so that the air entering the building will pass over a heated surface and thence flow to the various rooms to be warmed, is well adapted for small buildings and gives in many cases excellent satisfaction. A system of furnace heating is not well adapted for carrying air long distances horizontally for the reason that the motive force which induces circulation is extremely small and liable to be overcome by adverse winds. Systems of furnace heating are frequently illy designed and poorly erected and as a result this method of heating has gone into considerable disrepute. In many cases extremely small furnaces have been used and in order to obtain sufficient heat, the heating surfaces have been kept extremely hot, thus overheating a limited amount of small air; this comes from an attempt to make small volume of air heated to an extremely high temperature do the work which should be done by a large volume heated to a moderately low temperature. A hot air furnace with ample heating surface in proportion to grate and installed with well proportioned hot air flues and with exhaust flues leading from each room into the attic can be made an extremely satisfactory and desirable method of warming a 10 or 12-roomed house. The furnace should be installed as closely as possible to the windward side of the house so as to utilize as far as possible the natural air circulation to aid in the distribution of heat; it will generally be found much more satisfactory to co-operate with natural forces than to oppose them.

CONCLUSION.

In conclusion I would say that I have in this short address intended to call attention only to desirable and undesirable features in several of the most prominent systems of heating and ventilation. I have carefully avoided the discussion of detailed methods of design and the methods of proportioning the various parts of a heating and ventilating system for the reason that such methods are fully and exhaustively treated in well known text books on the subject and moreover could hardly be considered in the limited time at our command. I have myself endeavored to discuss the various questions of such design in a book on the subject of Heating and Ventilation, which I believe is accessible to all the members of your Association.

I am much pleased at the interest taken in this important branch of building construction by the members of your Association as I am thoroughly convinced that comfortable and healthy buildings are of equal importance with noble and artistic ones. There is no reason, however, why buildings should not possess all of these attributes and I am pleased to learn that the members of your Society have done so much towards solving the questions relating to the construction of both sanitary and beautiful structures. The architects of Ontario already occupy an honored position in the reputation of the world because of the artistic, noble and useful structures which they have produced; let us

hope they will not neglect to provide for all the elements which tend to comfort and healthy living, and that they will in the future as in the past continue to apply the most perfect systems in heating and ventilation.

DISCUSSION.

The President: Gentlemen, as I said before, we wish a full discussion on this paper of Prof. Carpenter's. We have with us this afternoon men who are quite capable of discussing and asking questions that may be pertinent to its subject; it is perhaps the most important subject we, as architects, have to deal with, for after all it matters not how beautifully we design a man's dining room or how artistically it is decorated and furnished, if he comes down in the morning and cannot get the room up above 60 degrees. Therefore I think Prof. Carpenter's paper is upon a subject we cannot pass lightly. As we have him with us it is possible he will forgive us for asking him a few questions on the subject.

Mr. S. G. Curry: Mr. President and Gentlemen, I have much pleasure in moving a vote of thanks to Prof. Carpenter for the very instructive paper he was kind enough to read to us. I do not know whether there is much room for discussion, because I agree with nearly everything he said. I think where there is a disagreement there is usually more discussion than where there is an agreement. There is only one point raised that I should be inclined to question, and that may be theoretically correct. It is with regard to the variation of hot water and steam surface. I find it is necessary to have 2 to 2½ times as much surface for steam in our climate; it may be due to the fact that I am in the habit of not using more than a pound pressure. In lieu of the gravity system a system arranged for working practically with little or no pressure, we have a system with little or no force in it running up four or five pounds of steam. Under these conditions possibly the proportions Prof. Carpenter states are practically correct, more theoretically correct than in fact, because like all these things it is a question how you consider the matter. I have been in the habit of figuring steam by the pound or less; and as far as I know I find my arrangement has answered every purpose satisfactorily. The address has been most satisfactory; in fact it has taken up all the different points in a thoroughly practical and sensible manner. It has gone over the history of heating pretty thoroughly and it is put in a very plain and comprehensive light. I do not know as I am in a position to do any criticising. As I said before, I agree with nearly everything that has been said, and I wish to compliment the Professor on his paper being most thorough in every point, and satisfactory; and I am quite satisfied it will be of great benefit to the members of the Association.

Mr. Burke: I have very much pleasure in seconding Mr. Curry's motion. I must express my surprise at the improvement in heating that is displayed in the "vacuum" system; the small water power is certainly astonishing compared with the amount of power required where they are depending on pressure to force the heat through the pipes. I have a system today in use where it is almost ridiculous to see the amount of water power that is used for the large quantity of surface to be heated; and yet the building is being heated. In regard to the exhausts I did not understand whether those were exhausts which where taken back to the furnace or taken back to the outside. I had a little experience in my own house with regard to the exhausts; I could not imagine why one of the flues would not heat and I went to the one built connected with the chimney and I found a great amount of cold air coming into the flue and passing from that down to the furnace, making it impossible to heat the room.

The President: I see we have several well known representatives of the trade here, and some of them may have had practical experience in those systems. Can we not hear from one of them?

Mr. Purdy: Mr. Gurney, Mr. Mansell or Mr. Armstrong.

Mr. Armstrong: I have had no practical experience in the use of any vacuum system, but I am interested in the description of the Morgan system, and I would like to ask what is the height of the column of mercury that they employ. I also notice he takes the air pipes and returns them to the boilers. I am very much interested in that, and if Professor Carpenter will give us that information I am sure every member would be delighted to hear him. Another point, the proportion of 1 to ⅔, I would like to ask if that is hot water at 212 degrees and steam at 212?

Professor Carpenter: In regard to the question asked by Mr. Armstrong, first, in respect to the apportioning of the radiating surface of hot water and steam, it is rather interesting in the way it came out. I figured it out on a theoretical basis that the proportion ought to be about 100 to 164; and the American Society of Boiler Makers, from an entirely different system of figuring, concluded that 166 would be the equivalent of 100 of steam. I got at it in an entirely different way from that but the results were the same I think from a theoretical and practical standpoint. We are now putting in radiators in that proportion, that is, giving the one and two-thirds square foot of hot water radiators where we put in one of steam. The whole thing depends on the temperature you run your hot water radiator at. This calculation is based on hot water about 180, as you will find if you calculate it through. If you run them at a lower temperature the radiators would have to be larger. That has got to be an almost standard practice; it was adopted almost unanimously after a long discussion by the American Boiler Makers; I was present and took part in the discussion at the meeting at which they adopted it. Regarding exhaust flues in the hot air furnace. I had in mind what I have often done in the hot air systems, that is, carrying exhaust flues up into the attic, not putting them outside because that leaves them in a position by which we can draw the cold air down into the room. But I have found in nearly every case that if these flues are simply carried to the attic they are certain to keep the system in equilibrium without bringing in cold air; but the hot air system is subject to vagaries; one sometimes finds the hot air going out through the cold air box, and the cold air coming out through the warm air flues.

Mr. Armstrong: I would like to know if the temperature the steam gets to at 120 is equal to the steam raised to 212 degrees in the vacuum? I understood that, you raise some hot water at a temperature of 120 degrees in the vacuum system. I would like to know if the steam is the same temperature as that raised from hot water at 212 degrees.

Prof. Carpenter: That depends. Steam is at an absolute pressure of two pounds per square inch. The atmosphere gives us fifteen pounds per square inch; if you pump up thirteen pounds that water will boil at 126 degrees; the steam would be abont that temperature 120 degrees; with the whole atmospheric pressure of 14 2/16 pounds steam is formed at 212 degrees. Steam at two pounds pressure would be formed at a temperature of 216 degrees. So that you see if we can reduce the pressure we can get almost any temperature we desire with the steam. And that was the intention with these systems.

Mr. Gurney: Do you consider the system of hot water heating, where the water is super-heated under pressure, getting the water so much hotter, an economical way of heating it?

Prof. Carpenter: The pressure system of hot water heating was given up because it was believed to be dangerous. I have never felt that it was safe; there are so many things which might happen, especially when you consider how the water is managed in the ordinary domestic heating. It seems to me it is almost suicidal on the part of people to use it; and for that reason I have never felt safe to recommend it. I would recommend it if we could raise the boil ng point of water without increasing the pressure, by putting in glycerine or something of that kind: but the objection to that is the expense.

Mr. Gurney: In using glycerine is the circulation as perfect as without it?

Prof. Carpenter: Yes, it is perfect. We have been conducting experiments with glycerine, and it does very nicely.

Mr. Gurney: May I ask what percentage if calcium chloride would be required?

Prof. Carpenter: I could not tell you that exactly, but it is a two-thirds diluted solution. Practically that won't do because it acts very actively upon the iron, rusts it. The chloride calcium does very well, but we found it damaged brass very slightly. Glycerine is the best; it don't attack any of the metals and gives practically excellent results; but it costs too much money.

Mr. Mansell: Is it possible to make any attachment to a hot water system to put more humidity in the atmosphere or in the air of the room. We understand that a certain amount of moisture produced the requirements, in the temperature, in the atmosphere. Is it possible to make any artificial attachment to a hot water system to give us a proper degree of humidity in the air

Prof. Carpenter: Perhaps I am not well prepared to answer that question, but I do know that an article of that kind has been put on the market by the Johnson Electric Company people, who furnished the automatic controlling device for regulating temperature, and it is claimed by them to operate very successfully. But I have had practically no experience with it. It consists of a device which is operated by a cat-gut which is very susceptible to a change in the humidity of the room; it will shrink very quickly with the dry air, and stretch with wet and let out steam or water until the cat-gut goes back to its proper form. That is the principle of the device, and it is claimed to work very perfectly, but I am not prepared to say how much of a success it is practically.

Mr. Gurney: There has been a radiator invented by one of the Ontario Society of Architects in which the top portion holds water, and it is evaporated by a heating device inside but it is not controlled in any way that I know of.

Mr. Mansell: How do you fix the radiating surface?

Prof. Carpenter: The method of calculating the radiating surface there is a formula that has been worked up from some experiments which I think is in this form. (Writes on blackboard)

$$\frac{70}{280} \qquad \left(B \times \tfrac{1}{4} W \times \frac{NC}{50}\right)$$

$$114$$

$$100 = 1$$

$$166 = 1\tfrac{2}{3}$$

$$\frac{25}{40}$$

The radiating surface depends on three things, the amount of glass exposure and wall exposure and the amount of cubic feet of air which is heated. This formula has proved to be very serviceable and practicable. The coefficient which we have put down at ¼ is subject to change in different climates. In that formula the coefficient of ¼ gives very satisfactory results in perhaps New York; it is not enough for Massachusetts; it should be about 15 per cent. more, and it should perhaps be about 10 per cent. more for Detroit. I presume for this place it should be something like 20 per cent. more. The formula is worked up on the principle that the difference in the degree of temperature between the inside and the outside air is 70; I think here it might run to 80. The difference between 70 and 80 would in this particular case make a difference of about 10 per cent. The reason it makes a difference of 10 per cent. is, in mathematics, you have 70 divided by 250, and it would be changed to 80 divided by 250; so that something like 10 to 15 per cent. more would probably be required here than with us because our extreme we usually consider zero; but we have colder sometimes than that; last week it was 17 below zero.

Mr. Armstrong: Taken from steam at 230 degrees and a factor of ¼ would it make any material difference whether it was in New York or Toronto if you took an outside temperature at zero and 70 degrees inside?

Prof. Carpenter: No. If you run your steam up two or three pounds that would compensate for the whole difference and then you could get along with that formula; I don't see why in extremely cold weather people would not be willing to carry a little more steam provided they did not run it up more than three, four or five pounds.

Mr. Denison: They do not like it above one pound.

Mr. Armstrong: It is not a formula for the first floor alone. Would you change it for the second floor?

Prof. Carpenter: Yes, in this formula I have here it was for the different floors and the hall; for instance for the hall and the first floor we have always taken "N" as three; on the first floor rooms and other than the hall "N" as two; and on the upper story rooms "N" as one; the rule being the N represents the number of changes which would take place every hour, which is premising, but it appears to act pretty closely with residence practice. I like to have a hall very well warmed and this formula throws in each hall a good amount of radiating surface.

Mr. Helliwell: What are the quantities for N and C in the formula?

Prof. Carpenter: C is the cubic contents of the room. N is supposed to be the number of changes of air which occur in the room in an hour. It would be scientifically correct if N were positively known.

Mr. Helliwell: There is one other point I would like to get some information on and that is the efficiency of running cold water through coils with the idea of cooling the air in the summer time with the use of the fan system.

Prof. Carpenter: The converse question of heating is one which has cost a good many people a good deal of trouble. It is perfectly feasible to cool air by passing it over a cold surface in the summer time. For instance, passing cold water through a coil of pipe and then blowing the air over it. That has been tried and been done and is being done in a number of New York theatres during the hot season. The first time the practice was undertaken I think quite a serious mistake was made, that of cooling the room too much. It has been found that it is not safe to lower the temperature lower than the air outside only a few degrees, possibly not more than five or six degrees, because it the air be cooled too much people who go in get chilled in a short time and the effect on the system is dangerous. It is easy to cool the air but it is not safe, for people going into a cool room from the outside are liable to be chilled, consequently this system has not found the favor that was expected, that is, it is not safe to cool the room but very little. If you have 100 degrees outside they have to keep a pretty high temperature inside. If you went went from 100 degrees to 90 degrees inside it might in a little while become chilly. The results have not been as satisfactory as they were expected.

Mr. Burke: Is the humidity in the building an object to a great extent in the fan system?

Prof. Carpenter: In most of the systems where the system is in charge of a janitor—some of the large systems—they require a janitor to take the humidity by means of a wet and dry bulb thermometer, but in a good many of them they don't; although in the last few years there has been a decided tendency to look to the moisture. The whole thing is the supply of the moisture; it has been brought out more possibly during the last few years than before.

Mr. Burke: Has not it been done automatically?

Prof. Carpenter: Only to a limited extent.

Moved by Mr. Curry, seconded by Mr. Burke, that the thanks of this Association be tendered to Professor Carpenter for his very interesting paper and his kindness in answering the questions asked him in reference thereto. Carried.

The President: I do not know whether you customarily find such an inquisitive audience but certainly the questions and answers have been of the greatest service to us.

Prof. Carpenter: It gives me the greatest pleasure

to give any information which I happen to have which you do not. I am also getting a great deal of information from you and thank you very much for your expression in your vote of thanks.

About the system I would put in I would say that I have never been tied down to any particular system. I have frequently installed hot water systems and then steam systems and there would be perhaps no very good reason except I find people prefer one or the other and usually they wanted a system particularly bad. In that case I have had no special reason to recommmend one or the other. I was thinking this afternoon of what I considered the advantages and disadvantages of each system; as to its advantages and then as to its disadvantages I see no reason why we should not be prepared to supply anything that is required especially if we give the people such information as we have on the subject. I have favored steam heating perhaps more than hot water simply for the reason that our steam fitters are not very good workmen ; they are getting much better however and during the last few years the objections we used to find in our hot water jobs have pretty nearly disappeared. About eight or ten years ago it was almost impossible to get a hot water job that worked perfectly. The pipes would not be well put up, not aligned nicely. The pipes would not be rimed ; but that was due to the carelessness of the workmen. But now we are getting better work and we can put in every kind of system. In large buildings, where it is possible, I believe in the vacuum such as the Paul & Webster people put on. I think it pays to put them on because it adds nothing to the first cost. Your circulating pipes can be kept smaller to pay any extra cost due to putting in their system, so that the owner will have no extra charge and he will have a system that is satisfactory. In small buildings or residences I prefer the Morgan system, although I am not prepared to say I would recommend that very universally ; it might not prove to be very good. But from what I have lately seen in it I think ti is a very excellent system. I stand without any prejudice in the matter.

Mr. Gurney : Which do you consider the more satisfactory, the one or two pipe system in regard to operation and economyr ?

Prof. Carpente : That seems to be a question of locality. The steam fitters in New York build a two pipe system ; they do not know the one pipe system ; they do not believe it will work. On the other hand the steam fitters of Chicago don't know anythiug about the two pipe system ; and there is the same prejudice against it; they do not think it will work; as you come out of New York State and Boston you won't find anything but the one pipe system used. It must be a matter of education with the steam fitters. The New York steam fitters tell me it is practically impossible to put up a one pipe system ; they will not put it up, their men will beat them ; and as a rule they do not try to put it up. So far as economy and efficiency is concerned I do not think there is any difference one is as good as the other, both work perfectly ; the one pipe system it seems to me is the only one that ought to exist because there is no use having two pipes when one will to the business.

THE O. A. A. EXHIBITION.

The president and office bearers of the O.A.A. are to be heartily congratulated on the interesting exhibition of architectural drawings and photographs which they were able to get together for the annual convention. The exhibits fall under three heads : Domestic Work, City Buildings, and Decoration. It was a rather noticeable point about the exhibition that there was practically no churchwork. By far the best and most interesting exhibits were of a domestic character—for the most part simple work in brick and stone and shingle. There was a general tendency in cottage buildings to use too many materials and textures for the size of the job to carry, and in some cases a rather strained delight in clapping on colonial adjuncts ; but, laying carping criticism aside, what one can appreciate in the Toronto domestic work is the sincere attempt to solve the problem of building not wholly uninteresting houses which shall in their main characteristics evince as good an English pedigree as that of the people who build them. It is a little surprising not to find the sterner traditions of Scottish domestic work more in evidence—a touch of the severity and restraint which reigned north of the Tweed till a century ago would do no harm in such a suburb as Rosedale. Where so much that was really charming was exhibited it is almost invidious to mention names. The mullioned-windowed house at Rosedale for Mr. Baillie by Messrs. Spoatt & Rolf cannot be passed by, however ; it is a beautiful and scholarly piece of work of very English character. Mr. Gouinlock's design for a straggling cottage country club at Lambton, while striking a more purely Canadian note, is equally charming. We trust that the virulent green shingles of which we see too much was not here proposed to be used. The drawing did not make this point very clear. Messrs. Chadwick & Beckett show a more distinctly American influence in their exhibits which are none the less charming on that account. Both Mr. Gemmel and Mr. Baker evince a predilictiou for English work in two very pleasing drawings at the platform end of the long room, while the photographs contributed by Messrs. Burke & Horwood, Messrs. Symons & Rae and Messrs. Gordon & Helliwell, show us much careful and thoughtful work, thoroughly modern, yet happily not tainted by the virulence of the "Art Nouveau' movement.

Among the city buildings there are quite a number of examples of that modern deformity, the building with its foundation at the first floor level. When will the self respect of architects and the taste of tradesmen combine to stop the silly practice of hoisting five hundred tons of piers and cornices on the edge of a plate glass window 100 feet wide ? When two tiny piers are left at each end of the site this anomaly of design to which steel construction has lent itself is only made the more apparent.

In the series of elevations in competition for the Metropolitan Bank at Montreal we have an interesting contribution to the narrow street front problem. It is the treatment of the lowest story that has given most trouble. Messrs. Darling & Pearson have certainly struck on the happiest arrangement. We have large city buildings illustrated by beautiful wash drawings from this firm, and also from Messrs. Sproatt & Rolph. Both evince a thoroughly sound type of Franco-American architecture, such as is usually found in the better class of sky-scraper ; both evince the drawbacks inherent in this type of building. A comparison is made none the easier by the fact that the illustrations are from the same hand and about as good as wash drawings can be. When architects begin to exhibit their working drawings instead of special productions criticism will become easier and our art will not be a sufferer.

In the decorative work of Mr. Challener there is much lyrical genius for colour and a true feeling for drawing. Decoration, however, is an epic art and requires a bigger, broader kind of design and a simpler, grander scale of colour than is known to that school which finds its highest sphere in the decoration of the ceilings of Paris cafes. Mr. Challener is yet young and the work of the great men is still with us to study. In these two facts there may possibly lirk a great deal that concerns the future of native Canadian decorative art.

Mr. Reid shows some less ambitious decorative schemes and in a tenderer key, but, nevertheless, broad in conception and execution. There is some dainty illuminated work by Mr. A. H. Howard—in this field colour cannot sing too clearly ; to the illuminator it is allowed to rival the peacock's necks with blues and greens ; the poppy's red, the rainbow's graded hues ; the irridescence of the pearl and beads of burnished gold are his to play with.

PERCY E. NOBBS.

THE COLORED INTERIOR DECORATION OF ARCHITECTURE.*

When so large a subject has to be dealt with in so short a time, it is necessary to select some one section or principle to which particular attention may be called, and in looking round to make such selection I find one upon which I have often laid stress before, and which cannot be too often insisted on with regard to decoration. I mean its subservient relation to architecture; its duty of respect to the architecture it is to adorn.

Let us for a time put aside the average dwelling room with no features that can be classed as architecture. Color can do much for it—can give it character, can give it proportion, and can make it lovely or unlovely ; but the result after all is a matter which concerns only the owner and the decorator. They can try what experiments they are inclined to, or what fads they fancy, and they do no man wrong. If the result pleases their friends, they have their reward, and if it does not, they will be satisfied that this is due to want of culture in their friends.

But it is quite another matter if the building under treatment has other than domestic functions, or has received from its author some definite architectural expression ; that is to say, bears some stamp of another man's thought.

When this is the case, it becomes the decorator's business to study that evidence of thought, and to endeavor to enhance its value. In pursuit of this intention, he has first to try to ascertain what lines or what features are really of the first importance in expressing structure and proportion. If he can find these, he must never lose sight of them, for these are the features or lines with which nothing else must interfere.

However varied or however rich the decorative detail of the wholemay be, the final result of colored decoration of architecture should be lucidity of expression. And this is only to be obtained by allowing the due proportion of expression to each feature which has a place in the ideal scheme of structure.

If such expression is really in due proportion, repose —that great element of beauty in all art, but most of all in architecture—is produced. For what is it that produces "repose" in art? It is the immediate satisfying of the mind's instinctive search for something ; and in architecture that something is stability. Now, this stability which the eye and mind demand is not one of which scientific or practical evidence need be forthcoming. It is that of which an instantaneous conviction is borne to the mind by the continuity of suggested lines of strength in reasonable proportion to each other. And it is these lines of suggested strength which color may do so much to explain or confuse. Nor is the explanation altogether so simple a matter. It is as harmful to over-accentuate any of them as to confuse them. The expression of each part must be relative. To exceed the due proportion of expression in any part is to disturb the balance. Blatant expression in color is like shouting one's own language in the ear of a foreigner ; it does not make things clear, and probably gives offence.

Another point which it is desirable to mention, because it is the subject of frequent misconception, is that lucidity of expression does not depend on the use or the use or omission of detail. The most elaborate and delicate detail is compatible with perfect lucidity.

The one necessary thing in using ornamental detail is to take care that it does not interfere with the main science. Used with proper skill and knowledge, it should be able to assist materially in its development. On the one hand, it should assist to explain surface or to accentuate line; on the other it is invaluable as a means of lowering tone and softening effect, without sacrificing purity of the individual colors. Further, it facilitates harmony by giving the opportunity of small "recalls" of colour—of importing, as it were, fragments of one colour into the field of another—one of the most essential conditions of complete success in harmony. This should be carefully noticed by students in examining the pictures of the best masters.

I have said just now that it is the first function of color, when used in architecture to assist in producing that "repose" which results from an instantaneous impression of stability. This means that the eye must be encouraged to recognize at a glance such features and proportions as indicate or suggest well balanced structures, whether that be expressed in the architecture or not; for it must and in fact does, often happen that structure is not outwardly expressed—at any rate not to the extent that allows instantaneous conviction of its sufficiency. A flat ceiling is one example. In such cases color steps in and suggests constructive lines of some sort, which, though they have possibly no relation to the actual invisible structure, suffice to satisfy the eye in a moment as to the balance and stability of the surface on which it must otherwise have hesitated in doubt. Moreover lines of some kind are indispensable to assist the eye and mind to travel over the surface of the building; and whether by moulding or by color, it is the disposition of these lines upon which depends the impression of "repose." If simple and suggesting the relation of one part to another, the eye grasps the meaning quickly and is at rest. But if the lines expressed (whether by mouldings or colors) are inconsequent, purposeless and without proportion, the eye becomes puzzled, restless and dissatisfied. The eye demands a clear path, not a broken wilderness.

To touch on another branch of decoration, and a most important one, the use of pictorial art, in connection with architecture. We are accustomed to hear the most transcendental talk over the idealism or symbolism of the subjects to be painted in this or that building. I am far from under-rating the value of this quality of art. What I want to point out is that it is the building as a whole, if it be a worthy building, which first has to be considered ; and that is the form, the tone, and the treatment or style that affect the building, not the "subject". For the harmony of the building it would not matter a jot whether the subject were "Cupid and Psyche" or "Moses in the Bulrushes." But it may ruin the whole effect, if the picture is in a badly proportioned panel, painted in too cold a key or executed in a style too crude or too complicated for its surroundings. Not one in fifty of even very able English painters has been trained to look at art from this side—or to consider the necessity of keeping the whole tone of his own work in relation to the decorative result in the whole building. Look at the paintings in the Royal Exchange. Not one, or perhaps but one, is in tone with its surroundings; not any two in tone with each

*A paper read before the Architectural Association in London.

other. I regret this the more because I first suggested in a report to the Gresham Committee, dated Oct. 9, 1890, that these panels should be painted historically.

Undoubtedly painting in the studio instead of on the wall itself tends to enlarge the risk of want of harmony with the whole surroundings, though it certainly presents some advantages. To take one disadvantage alone, the difference of light. This is almost certain to be different in degree and quality, and more than likely to differ in direction. This being the case, there is only too much probability of a general difference of tone between the picture and its surroundings when finally brought together. Even the design or cartoon of the picture—color apart—will often need some change, when tried on the spot, from what seemed satisfactory when viewed in the studio.

The colored bands or margins which in colored decoration are so valuable, are more than ever useful when pictorial treatment is adopted in the panels. They afford the means of connecting the more forcible coloring of the picture panels with the rest of the work, and so preventing them from appearing as detached patches. Apart from this function, they greatly facilitate and direct the passage of the spectator's eye over the whole work and aid that prompt grasp of form and surface which I have already spoken of as inducing the sense of repose.

The matters which I have mentioned are practically "axioms" which are absolutely independent of style or fashion. The building may be ecclesiastical or secular, classic or gothic, simple or elaborate, it matters not.

The general principles which should guide decoration are true for all. And it is this main point which it seems useful now to insist upon, because we find so many persons ready to substitute particular arrangements of color or pattern for any real knowledge of art or principles.

Be sure of this, that just as sound principles are independent of style or fashion, of any special harmonies of color, or of any character of design, so no design, no arrangement of color, no excellence of skill can really enhance the value of the architect's work if the decorator does not carefully think out and follow those immutable principles which, whilst they allow of an infinite variety of treatment, have for their base the expression of the repose and stability of the architecture.

J. D. CRACE.

SAND FOR BUILDING.

TORONTO, December 21st, 1903.

To the Editor of the CANADIAN ARCHITECT AND BUILDER.

SIR,—In your editorial notes, November issue, you state that "a Company who are carrying out dredging contracts in Toronto are sending out circulars re Water Washed Sand (whatever that may mean) and are asking a higher price for their material, which is a waste product, etc.

As there are three misstatements of facts in your article and as the conclusions you draw are based on these misstatements we wish to have them corrected.

1st.—Our sand is not the waste product of a dredging contract but we have spent $20,000 to build special plant, including a twin screw steam barge to bring our material to Toronto docks and it is dredged solely for the purpose of the building and contracting trade.

2.—A higher price is not asked "for this material with the high sounding name." Experiments show that 1% of clay or loam in sand decreases the strength of mortar or concrete made with it 10%, and as most pit sands have from 2% to 6% of clay, loam or vegetable matter in it, the value of the cement or lime is decreased accordingly. Our water washing consists of pumping two thousand gallons of water per minute and discharging it over and through the sand so that any loam, vegetable matter or clay is washed overboard and the pure, clean, waterwashed sand only is retained.

It is uniform in quality, the grains being graded from fine to coarse. Tests made at the City Hall, Toronto, shew that cement made with it in three months time is 57% stronger than pit sand. Toronto is the only city on the Great Lakes that has not been using dredged sand for from ten to fifteen years past. Nothing else is used in Chicago, Fort William, Port Arthur, the Canadian Soo, Detroit, Windsor, Toledo, Cleveland, Buffalo, Hamilton, Montreal, Kingston and Ottawa.

Toronto architects have complained for years about the poor quality of some sands that have been brought on work executed by them, but there being no fixed standard they found it hard to get just exactly what they required.

Last year we fixed a standard by washing out all fine material and screening out all coarse material so that we get an even quality of goods every day, pure and clean.

Architects and many builders have been quick to see the merits of our standard sand and our trade has increased 350% for 1903 over 1902 or from 6000 cubit yards in 1902 to over 25,000 cubic yards in 1903,

Trusting that you will give this letter equal prominence to the article containing the misstatements.

Yours sincerely,

SAND AND DREDGING, LIMITED.

FIREPROOFING METHODS.

"A lie which is all a lie may be met and fought with outright;
'But a lie which is part a truth is a harder matter to fight."

To the Editor of the CANADIAN ARCHITECT AND BUILDER.

SIR,—In your December issue appears a letter from Mr. F. W. Barrett, Agent of the Expanded Metal Company, in which he purposes to print cuts showing the effect of fires in buildings of terra cotta arches, and of buildings of concrete construction.

Your correspondent starts out on his crusade by referring to the fire in Pittsburg, Pa., of May 1st, 1897, and selects for his demonstration the Horne Department Store, while ignoring all reference to the Horne Office building adjoining; the floors of the former being of dense tiles, the latter of porous material.

He states :—"The fire burnt out the woodwork and contents but was NOT HOT enough to destroy the stone work on the front; it WAS HOT enough to destroy the terra cotta floors throughout a great part of the building" (the capitals are mine).

When one considers that the building in question was a Department Store—6 stories and basement, filled with the usual stock of such stores, i.e., packing, crockery in crates, dry goods, etc., which were completely consumed; the intensity of the fire may readily be inferred.

In reply to your correspondent's assertion that the fire destroyed the terra cotta floors, I would refer him to the report of Mr. S. Albert Reed, manager of the New York Tariff Association, an authority, presumably unbiased; he says—"The collapse of the roof involved in more or less damage almost the entire half of the building east of the large wall"—"Now although FOUR-FIFTHS of the arches were standing after the fire, AND ONE COULD SAFELY WALK OVER THEM (if "Fireproof" of Chicago is right, it does not seem safe to do that on concrete floors even before a fire) there is nevertheless a damage throughout the building to the under side of these arches by the breaking and dropping out of the lower webs."

It has long been contended, that dense tile are not as good as tiles of porous material; and reference to the Horne Office building, wherein the floors were of the latter material and which came out with flying colours, again proves the claim good.

I await with interest Mr. Barrett's instances of concrete floors under fire: but in the meantime beg to call his attention to some very recent collapses of concrete floors, which probably deeming discretion the better part of valor, on being tested for strength, forthwith fell in, killing several workmen :—J. L. Mott Iron Works, Trenton, N. J., Ferro-Concrete, December 8th; Bellefield Apartments, Pittsburg, Expanded Metal, December 5th; Will & Bauman Building, Greenpoint, October, and several others as enumerated in the Fireproof Magazine.

Yours truly,

A. MULLER.

628 Carlton Ave., BROOKLYN, DEC. 29, 1903.

DECORATIVE CEMENT PRODUCTS.

BY CHARLES D. WATSON.*

In the history of the development and use of building material the nineteenth century might well be termed the experimental age of Portland cement, but the beginning of the twentieth will surely mark the age of cement construction. Bridges, foundations, pavements, viaducts, tunnels, breakwaters, piers, reservoirs and houses are now being built of cement

DETAILS ON IVEY WAREHOUSE AND ST. CATHARINES LIBRARY.

and its rapid advancement bids fair to fulfill what once seemed a marvellous prediction that "the house of the future will be poured or moulded in forms and the average man will select his house from standard designs as he now selects his furniture." What has long been called the building material of the future has become the material of the present.

No small portion of this rapid development of uses of Portland cement for building has been the advancement made in the manufacture of plain and ornamental cement stone.

That stone was manufactured long before the records of history is shown by the discovery of artificial stone vessels in the ancient ruins of the prehistoric mound builders. Their stoneware is supposed to have been made by pulverizing lime rock which when moistened with water, was moulded into the desired shape, set in the sun and being continually sprinkled with water the chemical action took place, the vessel became hard and at last formed a stone which has stood the test of ages and remains to-day as a striking example of the durability of cement products.

We have plenty of evidence that the Romans knew the value of concrete and wherever they have employed it in building it has demonstrated its superiority over natural stone under similar conditions. The whole of the dome of the Pantheon with its 142 ft. span is of cement concrete. The inside lining of one of the Grecian temples is of cement concrete, while the facing was of stone ; the latter has long since given up its struggle with the elements, but the concrete which was intended to play the minor part stands as smooth and solid as when made. A Roman aqueduct lined with cement built in the first century has been preserved in perfect condition for the past twenty centuries.

We have reason to believe that even the pyramids which have so long stood as an example of the marvelous work of a race who could perform feats in engineering that no man is able to explain, are made merely of separate blocks of concrete.

From the fall of Rome until the dawn of the nineteenth century the use of cement was apparently little known except for cement mortars. With the discovery of Portland cement a material was again produced which made satisfactory concrete and from that time to the present day cement stone has made rapid progress, especially in Europe, where it has reached a high stage of perfection and takes high rank among the industries of England, Germany, France, and Belgium. In the year 1902 one firm alone in Germany manufactured $1,080,000 worth of cement products including plain and ornamental building stone, sewer pipe, statuary, park ornaments, etc. The company have four large plants and employ an average of 2,500 men per year. In many parts of England cement stone is extensively used and large plants are now engaged in its manufacture.

The use of cement stone in America has until recent years been less marked, due in great part to the abundance of other cheaper building material. The last decade has shown a remarkable advancement in the manufacture of stone. One of the oldest examples of this construction is the house of W. E. Ward at Port Chester, N. Y., built a quarter of a century ago and which stands in perfect preservation today. Perhaps the earliest work of any magnitude were the great hotels of

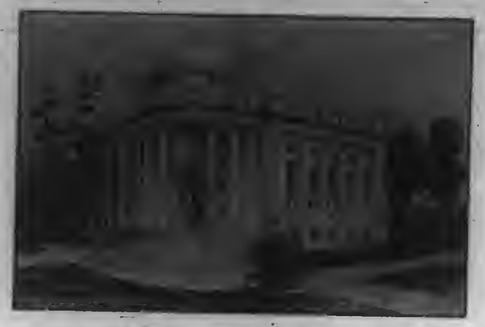
WAREHOUSE, WELLINGTON STREET WEST, TORONTO.

Florida and California and the Pompeiia at Saratoga, N. Y. Many difficulties were met in cement construction in its early stages through ignorance of the use of Portland cement and this class of construction gained for itself the name of being very unreliable. Continued experiments and improvements in methods have to a great extent offset this feeling until now it can safely be said to be a thoroughly established enterprise which is destined to work a revolution in building construction. The business has increased from a few isolated

*Chief Engineer Roman Stone Co., Limited, Toronto, Ont.

factories scattered about the country until now it is almost impossible to find a city of any considerable size without its cement stone factory. Some cities have a plant to every 40,000 inhabitants and judging by the present rate of increase cement stone factories will soon be as plentiful as brick yards.

All of the larger Canadian cities have artificial stone factories of some kind, but undoubtedly the largest and



CARNEGIE PUBLIC LIBRARY, GUELPH, ONT.—BUILT ENTIRELY OF ROMAN STONE.

best equipped is that of the Roman Stone Co., of Toronto. This plant has been in operation for a little more than a year and has in that time turned out a considerable quantity of very creditable work. Their plant is a model of its kind being equipped with pattern shop machinery, stone crushers, grinders, and screens, dryer, mixer, traveling cranes, and hot air blast heating.

The company is manufacturing under the patents granted to C. W. Stevens for the cement stone known as Litholite. The patents are broad and cover the manufacture of cement stone by casting concrete in a sand or other absorbent mould. The patent is about five years old. The process while very simple gives the ideal conditions for making cement stone. The concrete mixture made of Portland cement and ground stone of many different sizes is poured in a semi-liquid condition into a sand mould exactly as melted iron is cast in a foundry. The patterns are made the exact shape, size, and finish of the stone required and moulded in the sand, no allowance for shrinkage being required. As soon as the concrete material comes in contact with the sand the water filters off, leaving the cement stone in plastic condition with just enough water to produce perfect crystallization. The process is quite similar to the method of preventing settlement in loose earth fills by puddling with excessive water. No amount of pressure or tamping by hand or machine can make a stone as compact and homogeneous. Proof of its great density is shown by its specific gravity which is about 90% of the stone of which it is made, the loss of 10% being in all probability due to the difference in weight of the cement and stone. The process bears a marked resemblance to the method by which nature has produced our best building stones, i.e. by the depositing of sand in water. Nature has cemented her stone by the action of heat and great pressure, but Portland cement accomplishes in a short time what requires ages by nature's method.

The great feature of the process is the absorption of the water by the sand which surrounds the cast. This sand retains the moisture and acts as a wet blanket to nourish and feed the cement with just sufficient water to produce perfect crystallization. The process produces a stone absolutely uniform in color where heretofore cement stones have always had the drawback of having a dark and spotted appearance of the surface when made in rigid moulds. Most cement stone has to be painted or coated to give it a suitable color for decorative purposes in high class work. The question of methods for obtaining presentable surfaces to concrete work has baffled the engineering profession for years—all cement washes or paints having long since been discarded as only temporary improvements. Stevens' process has solved the mystery and produces a stone so closely resembling nature's product as to deceive the experienced eye upon the closest examination. It enables one to reproduce any desired finish that can be obtained in fine cut stone and at considerable less expense. It has a much finer appearance than terra cotta, and unlike it or any other cement stone admits of fine hand carving; being of so uniform a texture and without cleavage it is impossible to distinguish the hand worked from the cast faces.

The stone used by the Toronto company is nothing but the best selected building stone. For white stone Niagara lime-stone and pure white marble are used; for gray, brown, red, and olive similar colored sand stones are used, thus avoiding the difficulty heretofore found in the fading of the colors used in making cement stone.

The stone upon the arrival at the plant is carefully inspected and all unsound material rejected; if found to be dirty it is thoroughly washed and then dried in a large rotary drier. It then passes through the crusher

EXAMPLES OF ORNAMENT.

and grinder from which it is carried by the conveyor and elevator to the rotary screen on the second floor. This screen is provided with three different sizes of mesh which separates the crushed stone into three different sizes, each of which is deposited into an individual bin; these bins together with a cement bin are located on the first floor directly over the mixer. When making a

mix of cement and stone a definite amount is taken from each of these bins, the quantity depending upon the purpose for which the stone is intended to serve and governed by certain rules determined by continued and careful experiment to obtain the best results. This grading of the crushed stone is, beside the careful selection of the cement, one of the most important factors in the manufacture of stone. It has long been recognized that great care should be taken in this particular. Many concrete and cement stones are made by merely mixing a little sand and gravel or crushed stone with cement in certain proportions, no attention being paid to the size of the grains of the sand or gravel. Such work combined with lack of knowledge in selecting and

FACTORY OF ROMAN STONE COMPANY, LIMITED. TORONTO, ONT.

handling cement has caused cement products to be regarded with undue suspicion.

After the cement and stone have been thoroughly mixed dry in a mechanical concrete mixer the water is added, not by the usual method in mixing concrete, but water which is kept at a constant temperature and the quantity automatically measured. In this way absolutely uniform results are obtained.

The ingredients are then thoroughly mixed wet for five minutes and run off into the agitator or ladle. This agitator is a large tub or barrel fitted with spiral paddles which are continuously revolved to keep the mix uniform. The agitator is carried about the foundry by a travelling crane of which the plant has three all equipped with two ton triplex hoist. The cement mixture is poured into the moulds through a funnel and T pipe to keep it from cutting through the sand moulds. After the casts are made the stone is allowed to remain in the sand from three to four days when it is removed to the storage shed and carefully finished, all necessary precautions being taken to insure perfect results.

While the proper munipulation of the cement and careful observance of certain laws are necessary for producing the best product, yet by far the most important factor in manufacture is the selection of the proper cement. While nearly all architects and engineers realize the importance of proper testing, yet it does not seem to be universally known that a cement may satisfy one or several conditions yet fail in the special use for which it is intended; thus cement has been selected for use in making stone that stands the highest test and was universally recommended by professional men experienced in the handling of cement, yet imperfections have resulted that caused distrust on the part of the user and no end of annoyance to the manufacturer. It does not follow that any cement will give satisfaction for the manufacture of stone. However cement casts for building purposes have been manufactured in Europe for years and we find that these difficulties in manufacture have, by the aid and research due in a large part to the Association of Portland cement manufacturers, been successully overcome, where satisfaction is guaranteed and the industry can safely be said to have passed the experimental stage and stone is produced which in many ways excels the natural product.

The crushing strength of Roman Stone at the age of 6 months has been found to be from 2000 lbs. to 4000 lbs. per square inch depending upon the material used. All stone subject to tensile stress is carefully reinforced with steel. Stones as long as twenty feet have been made in one piece at the Roman Stone Company's plant and single piece columns are sold at a price little in excess of what the same would cost in wood.

The officers of the company are well known Toronto men who have been prominent in the promotion of some of Canada's most promising industries: Lt. Col. H.M. Pellatt is President, Hugh Blain, Vice-Pres; A. E. Ames and Col. James Mason are Directors with G. P. Ames as Manager.

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The third edition of the Canadian Contractor's Hand Book is now on sale. The book has been revised and enlarged to upwards of two hundred pags, and the title changed to the Canadian Contractor's Hand-Book and Estimator, considerable matter bearing on the cost of performing various kinds of work having been added.

The price of the third edition, mailed free, is $1.00 to subscribers of the CANADIAN ARCHITECT AND BUILDER, and $1.50 to non-subscribers. Order from the publishers,

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EXAMINATION TO QUALIFY FOR ASSOCIATESHIP

—IN THE—

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The Royal Institute of British Architects desiring to give facilities for those in the Colonies to qualify by examination for associateship in the R.I.B.A., will hold the fourth examination from June 24th to July 1st, 1904, in Montreal. Applications, fees and probationary work must reach London by the first mail arriving after April 9th, 1904 Intending candidates who must be not less than 25 years of age, can obtain application forms and copies of the previous examinations on application to

ANDREW T. TAYLOR,
Hon. Sec. R. I. B. A. for Canada,
North British & Mercantile Building,
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Contributions of value to the persons in whose interest this journal is published are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

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NOTES.

We may well ponder over the fact says the London Builders Journal, that Sweden sends us yearly £300,000 worth of setts and kerbs, manufactured goods, duty free. We may well think over the significance of this, and bear in mind, as an example, that the Dartmoor quarries have lost a considerable portion of their trade in these setts and kerbs because Norwegian quarry-owners can pay their workmen less money and send their finished material into our ports without paying any duty on it.

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THE LATE MR. J. F. PEACHY.

Mr. Peachy, who died at Quebec, his native city, on the 31st December last, aged 73, was first a pupil of the late P. Gauvreau, local Government Architect for many years, and then studied for some time under, and was partner of Mr. Chas. Baillarge, Architect.

During his professional career he erected, after its destruction by fire in 1882, the Parish Church of St. Jean Baptiste, of which Mr. Baillarge had fathered the first edition in 1854. Prof. Haire, of New York, considered that the interior of this edifice, due to its height and light and the elegance of its proportions, compared favourably with the New York churches.

Mr. Peachy was the architect of the RR. gentlemen of the Seminary of Quebec, whose chapel he re-built, after its destruction by fire, and also what is called "Le Grand Seminaire," uniting the old Seminary to the University Buildings, erected under Mr. Baillarge in 1854.

The subject of our notice also designed the new Cathedral and the Seminary buildings at Chicoutimi; the interior of the church of N. D. de Ste Anne de Beaupre; the church of N. D. de Lourdes at St. Sauveur, together with numerous buildings, including chambers, presbyteries, school houses, private residences, as well in many of the parishes of the Province of Quebec as throughout the city itself.

Mr. Peachy was, for some 20 consecutive years, a representative of St. John's Ward, Quebec, in the City Council, becoming in time president of the road and then of the Water Works Committees.

He was one of the church wardens for the Parish of St. Jean Baptiste; for some years the president of the school of Arts and Trades, which had its rooms in a very nice building, designed by him, on St. Joachim St. He was a past president of the Province of Quebec Association of Architects.

The late Mr. Peachy was, in every respect, a man of ability and unimpeachable charatcer.

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BY THE WAY.

I am pleased to note the protest entered by the Builders' Journal of Baltimore against the proposal to build in New York a six-storey school with accommodation for 4,500 pupils. Emphasis is laid on the danger to which the children assembled in such large numbers would be exposed from fire and disease.

× × ×

The New York Electrical Review has a word to say to architects and builders on the desirability of providing an abundance of outlets when wiring a house for electric light. Dark corners should be avoided, and provision made to light when required every part of the house to which access may be desired without the necessity of resorting to matches and kerosene lamps.

× × ×

The story is told of an Australian missionary in China who was endeavoring to convert one of the natives. "Suppose me Christian, me go to heaven?" remarked Ah Sin. "Yes," replied the missionary. "All right," retorted the heathen, "but what for you no let Chinaman into Australia, when you let him into heaven?" "Ah," said the missionary with fervor, "there's no labor party in heaven."

One brick never built a house, neither will one ad build a business.

The famous leaning tower has changed owners. It seems there was a lien on it.—Toronto World.

The sudden death of Mr. Samuel Coulson, general manager for Messrs. H. R. Ives & Co., Montreal, has occasioned wide spread regret. Mr. Coulson was suddenly stricken by heart failure while visiting at the home of his brother in Toronto.

LEGAL.

Mr. Legriel, a French architect, being dissatisfied with the manner in which one of his buildings was reproduced from a photograph in a scientific journal, called La Nature, instituted an action, charging that the reproduction was a forgery. The court dismissed the case. It was laid down by the judge that everybody had the right to reproduce a public way, and consequently the houses which were to be found alongside; moreover, a critic of art had the right to give evidence in his article by views which became graphic information and corresponded with literary quotation. Whenever there was an abuse the judge could intervene if called on.

NOTES.

Mr. William Fraser, well known to Toronto architects as a quantity surveyor, has been appointed the representative in Toronto of the Gilmour Door Company, Limited, of Trenton, with office at 49 Yonge Street Arcade.

The most beautiful colored sheet-glass is made by the French and Belgian manufacturers, such as sheets composed of two layers or coats of glass, white and colored, and in some instances sheets made of white glass, and covered over with as many as four different layers of colored glass, put on very thin, and equal in thickness on the whole of the surface. For the coloration of this glass, as for all colored glass in general, the oxides of the different metals are used. For blues the oxide cobalt, or zaffer. For the different shades of blue, different proportions of cobalt. For a very light shade of blue for spectacles, a mixture of cobalt and red oxide of iron. London smoke is obtained by a mixture of the oxides of copper, iron, and manganese. A black is produced by increasing the proportions of these three oxides. Purple glass has for coloring element oxide of manganese. A glass so colored and made with soda gives a purple shade, edging on the red, while a potash glass will give a bluish purple. This color is made of a deeper blue by the addition of cobalt. The brown purple is made with a mixture of oxide of manganese and oxide of iron. The purple of the ancients can be perfectly imitated with a mixture of oxide of manganese and red oxide of iron.

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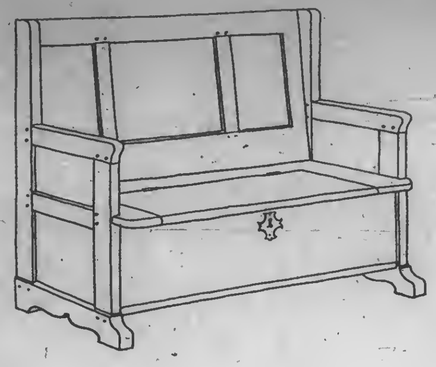
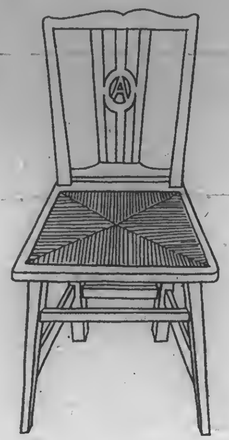
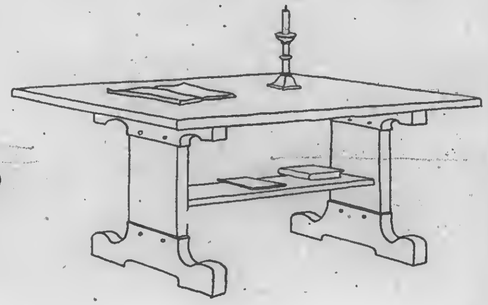
OSPEDALE MAGGIORE, MILANO
FROM A DRAWING BY PROF. PERCY E. NOBBS

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
JANUARY, 1904

FVRNITVRE
FOR A COVNTRY HOUSE







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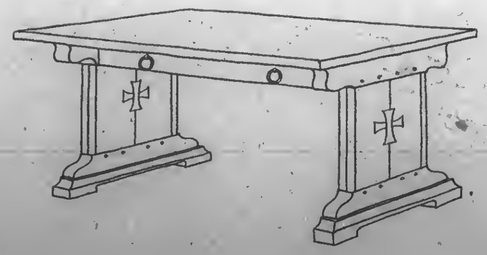

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JANUARY, 1904

ANCIENT MOSAIC
RAVENNA
SCALE 1 INCH=1 FOOT

FROM A DRAWING BY CECIL SCOTT BURGESS

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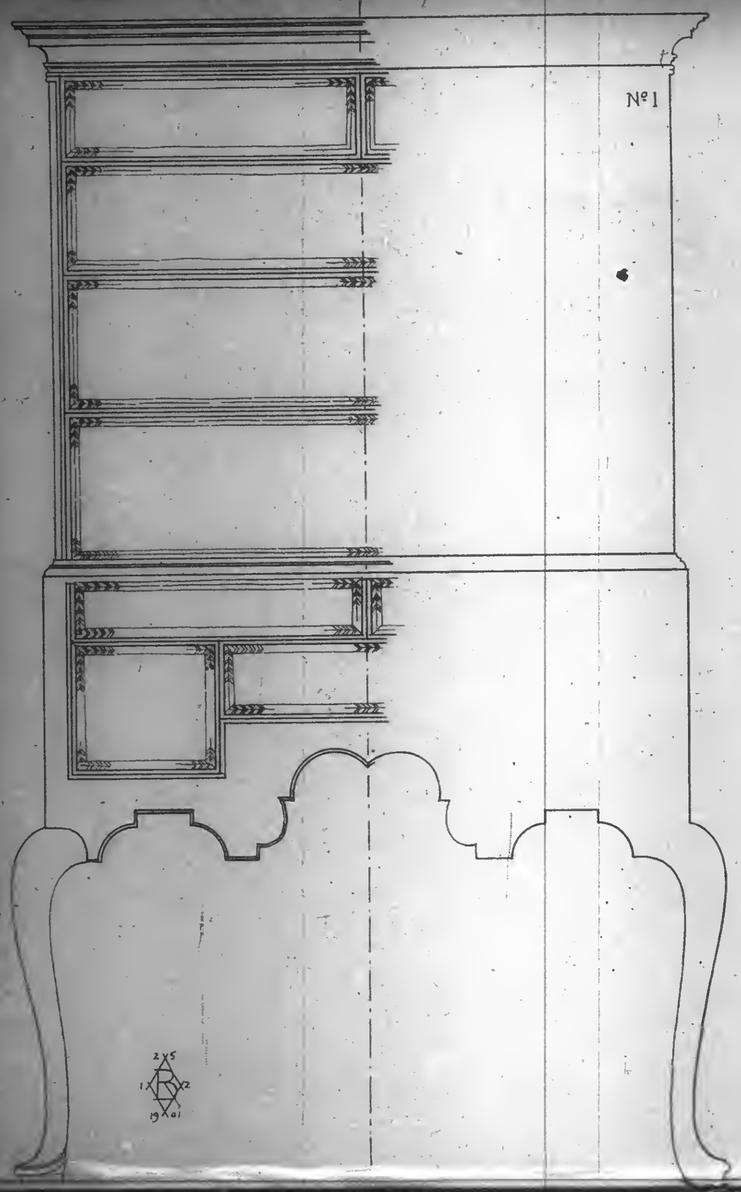

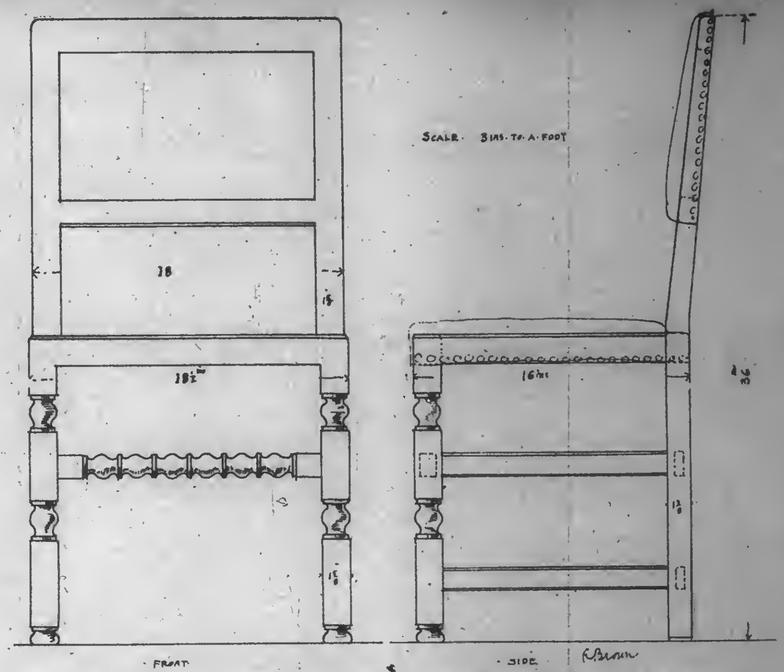

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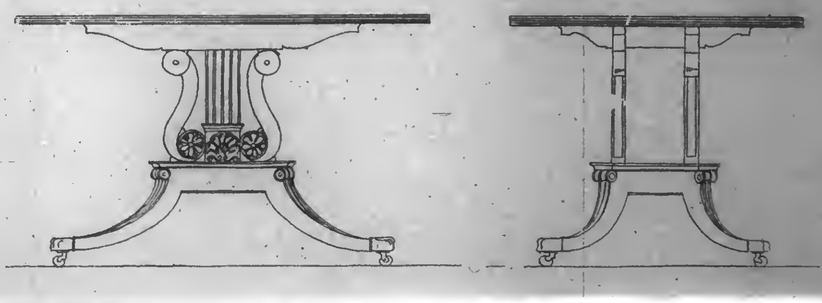
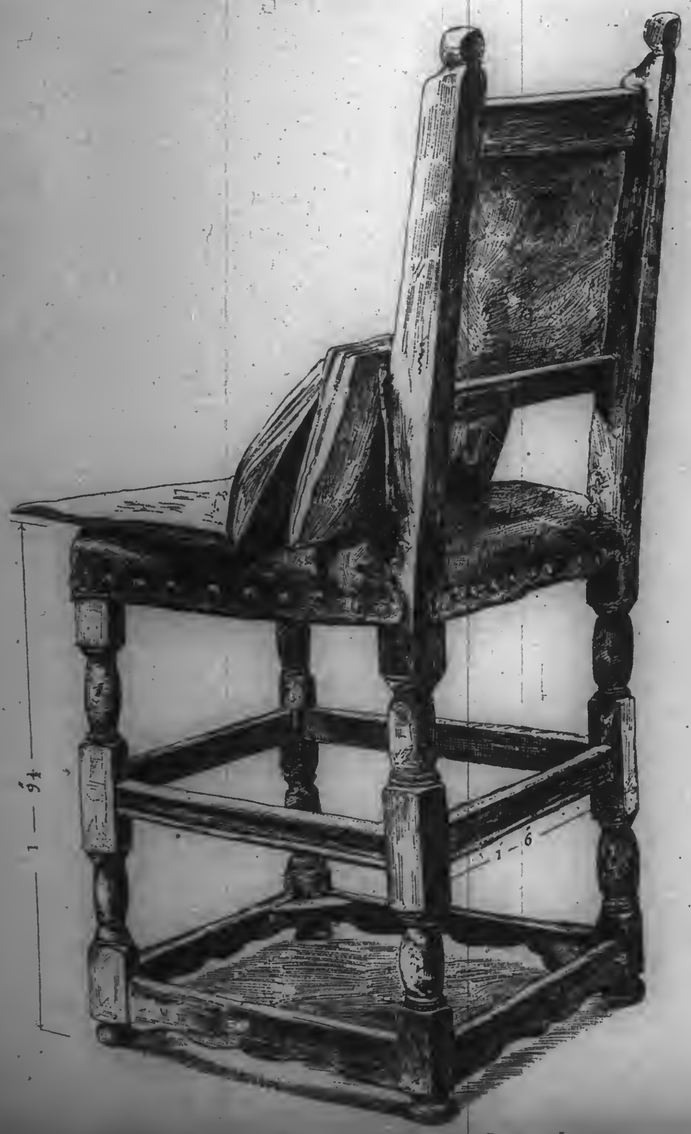
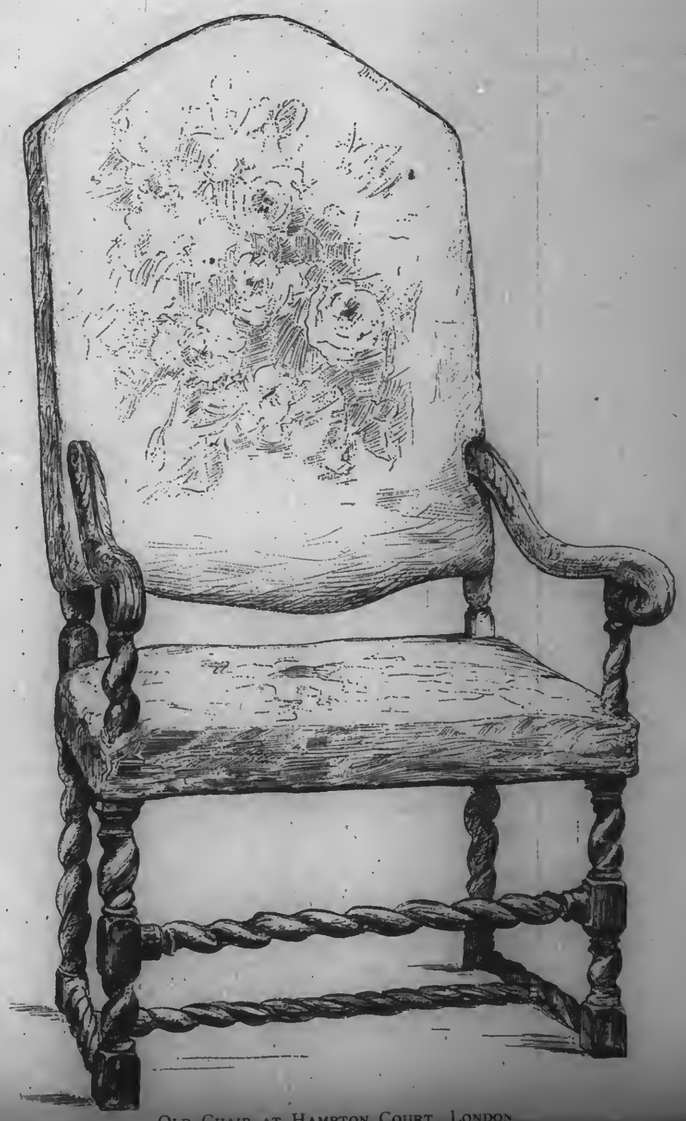


AN OLD COLONIAL HIGH BAY



OLD CHAIR FROM HATHERLY'S LIFE CLASS STUDIO, LONDON



OLD CHAIR AT HAMPTON COURT, LONDON

SKETCHED BY PROF. PERCY E. NOBBS

(*a*) ADAMS, ABOUT 1780, MAHOGANY, INLAID; (*b*) HEPPELWHITE (?) ABOUT 1780, PAINTED;
(*c*) CHIPPENDALE, ABOUT 1760, WALNUT

SETTEE, WALNUT AND VENEER, ENGLISH, 1760-1780
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The Canadian Architect and Builder

VOL. XVII.—NO. 194. FEBRUARY, 1904.

ILLUSTRATIONS ON SHEETS.

C. A. & B. Students' Competition for a Public Library—Design by "Ionic," (Mr. Edgar Guy) awarded First Place.
C. A. & B. Students' Competition for a Public Library—Design by "Mic" (Mr. Louis Labelle) awarded Second Place.
C. A. & B. Students' Competition for a Public Library—Design by "Napsugar" (Mr. Clarence Thetford). awarded Third Place.
Cottage at Winnipeg, Man.—Geo. Browne, Architect.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Oak Cabinet with Copper Mounts.—Designed by Robert Brown, Boston, Mass.
Elbow Chair by Sheraton, About 1870.
Buffet.—Designed by Robert Brown, Boston, Mass.
Sant Agastasia, Verona, Italy—West Doorway.—Drawn by Prof. Percy E. Nobbs.

ILLUSTRATIONS IN TEXT.

Portraits of Officers of London Builders' Exchange.
Portrait of President, Province of Quebec Association of Architects.
Portrait of President Ontario Association of Architects.

CONTENTS

Editorial	25	Toronto Builders' Exchange Dinner	45
Students' Competition	26-27-28	An Improved Directory for Buildings	46-47
O.A.A Annual Convention	29 to 36	Sculpture and Its Relation to Architecture	ix
The Delineation of Architecture	37-38-39-40-41	Toronto Builders' Exchange	x
The New President of the P.Q.A.A.	42	The Turin Exhibition	x
Rubber Tiling	42	Business Notes	x
P.Q.A.A. Annual Convention	43	Personal	xi
P.Q.A.A. Exhibition	44	Plaster and Stone	xi
Correction	44	The Lighting of Churches	xii

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MR. W. A. LANGTON, Architect, London, Eng.
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" W. H. ELLIOTT, Toronto.
" A. F. DUNLOP, R.C.A., Architect, Montreal.
" FRED. T. HODGSON, Architect. Collingwood, Ont.

Students' Competition.

The report of the Committee of Award is printed in this number.

The sixteen sets of drawings received in this competition have been placed on exhibition in the rooms of the Ontario Association of Architects, 96 King Street West, Toronto, and will afterwards be exhibited in the office of the CANADIAN ARCHITECT AND BUILDER in Montreal.

An Important Decision.

The Supreme Court of Massachusetts, has recently decided that when an insured building is destroyed by fire and cannot be replaced except at a cost greater than that of the original structure, the companies holding the insurance policies are liable for the difference. This decision applies to general policies of insurance in which the limit of liability is not specifically stated. There are two remedies open to the insurance companies: either to limit the liability in all policies, or charge stiff rates on all but buildings constructed on fire proof or fire resisting principles.

Elevators in Factories

The Toronto Chapter of the Ontario Association of Architects will ask the Provincial Government to make certain amendments to the provisions of the Ontario Factories Act governing the installation and operation of elevators in factory buildings. Section 51 of the Act adopted 1901, provides that elevator shafts in factories shall be provided with automatic hatch doors. The increased speed at which elevators are required to travel to meet modern business requirements renders the use of hatch doors impracticable, and they are found to be not only a nuisance but unless used with gates, dangerous.

Effect of the High Cost of Brickwork.

Already there seems to be trouble in sight for the building trades in Hamilton. The bricklayers of that city have intimated that they will demand 50 cents per hour next season. As a result less building will probably be done and in buildings that may be erected, the use of brick will as far as possible be avoided. The high cost of brick-work should tend to hasten the introduction of cement for the construction of the walls as well as foundations of buildings. It is already apparent that for this and other purposes cement is destined to be extensively employed in future building operations.

The Baltimore Fire.

The tremendous destruction of property resulting from the Baltimore fire is conclusive evidence, that modern fire fighting appliances and methods of fire proofing buildings are of little avail to check or subdue a fire that has once gained headway under untavorable weather conditions. Architects, insurance and municipal authorities and building owners will await with much interest the reports of experts, which we hope will shortly be forthcoming, showing the behaviour during the conflagration of buildings of supposedly fireproof construction. Meanwhile there will probably be an influx of architects into Baltimore in search of information and commissions.

C. A. & B. STUDENTS' COMPETITION FOR A PUBLIC LIBRARY FOR A SMALL TOWN.

Report Of Committee Of Award.

The Committee in presenting their award and criticisms, wish to express their appreciation of the generally high character of the designs submitted. They consider, however, that the majority of the competitors might have made themselves more familiar with the requirements of a library and particularly of the working requirements of a library of the small size described in the conditions. As regards the criticisms appended, it might be said that the designs other than the first four are not placed in the order of merit.

The committee award the first place to the design by "Ionic," second place to the design by "Mic," third place to the design by "Napsugar," and honorable mention to the design by "L'Avenier."

A. F. Wickson
William Rae
J. P. Hynes
J. C. B. Horwood
A. H. Gregg
} Committee.

[The names of the successful competitors in this competition are: "Ionic," Mr. Edgar Guy, 8 McMaster Avenue, Toronto; "Mic," Mr. Louis Labelle, 136 Parc Lafontaine, Montreal; "Napsugar," Mr. Clarence Thetford, 237 Dufferin street, Toronto; honorable mention, Mr. L. Van Egmond, 508 McKinnon Building, Toronto.]

Below will be found individual criticisms by the members of the Committee of Award of a number of the drawings submitted in the competition:

"Ionic."—(1st prize)—In this design the author has shown an understanding of the character of a building called for in the competition. The elevations, broadly considered, express the purposes of the building by their effect of scholarliness, simplicity and repose, developed from a plan in which the same qualities are to be found.

Criticising in detail: the plan is laid out on simple lines, and apart from the technical requirements of the building, is excellent. There is a thoroughly monumental feeling in the treatment, the axes are well considered, while every room is well proportioned, and asserts its purpose unmistakably.

The entrance steps are a good preparation to the vestibule, which is of suitable size and proportion. The rotunda as the author names it, forms a useful and interesting centre to the main portion of the building.

Considered from the standpoint of the Librarian, however, the plan is open to severe criticism. The element of administration and supervision has been almost entirely ignored; in fact each reading room forms an independent unit, and is not related distinctly enough to the main sources of inspection and supervision. This might be overcome to some extent by placing doors into the catalogue and librarian's rooms, or by arching between one or more of the bays in the walls between the rotunda and the reading rooms.

The reading rooms are properly lighted as also is the stack room.

The elevations are well handled, the general proportions being good, and the features carefully treated. The entrance is well marked, and the detail in connection with it is appropriate.

The wash work of the elevations is rather undecided, but the line work is excellent, firm and authoritative, and the detail is indicated with wonderful clearness and accuracy.

"Mic"—(2nd prize)—In this design the plan and elevation both lend themselves to the unrestricted building boundaries of a small park, such as would be found in a small town.

The plan is simple and is good for these reasons, viz:—liabrarian is in close touch with stacks, is easy of access and commands an almost unrestricted view of reading room. The defects in the plan are: 1st, the ladies' toilet room is too prominent and the men's not sufficiently so, being beyond the control of librarian. A sine qua non in small library building is that everything must be under the supervision of the one attendant. 2nd, the stairs should be from stack room so that books may be brought up direct: there should also be an entrance to the stairs so that books received in cases may be taken down to the "work" room which should be in the basement under the stack room. The grouping of external features is somewhat marred by the competition between the gable and the tower. Instead of two separate windows with a mullion under the arch of each a mullion window extending the length of both of these openings would possibly have been an improvement. The choice of rubble walling was good. The rendering is exceptionally good.

"Napsugar."—(3rd prize)—This is a fairly well conceived plan with the exception of the Committee Room appearing to be inserted more to fill a vacant space than a requirement of the library. The attendant has fair supervision of the reading rooms from the desk, but not as much as would be desired. The entrance is very effective and proportionate. The elevation is well conceived and well rendered. It's weakness is the rather wide spacing of the columns to main entrance and the poorly proportioned windows with their rather cramped arches which form the principal features either side of the entrance.

"L'Avenier."—(Honorable Mention)—This design in the French Chateau style shows careful study and much merit in rendering as well as design. The ink drawing of the side elevation is particularly effective. As regards the plan, a great improvement could be made for the general convenience of the building had the delivery desk been moved forward to line with the rear wall of the main building and the vestibule projected forward to correspond; in this way the view of the reading and news room from the delivery desk, which has evidently been considered, would have been much more effective. As to the exterior, it would seem as if there are rather too many features in the front for a building of this size. The general effect of this drawing would have been much improved had the lettering been less obtrusive.

"Tacks."—The author has apparently not given very thorough study to the problem in regard to the plan—the accessories of Lady's Room, Magazine Room as also Board Room, for which the Librarian's office would adequately answer, being added more for their external effect than for their necessity to a library of such small requirements. The one attendant who is all that such a small library could be counted on having, is not given a good oversight over the reading rooms by reason of their entire separation from the counter.

The conception of the elevation is fair, but the detail is not so good, while the rendering, particularly of the front elevation, is very feeble.

"Number 4"—This design is a very pleasing conception for a library building of the required size both in plan and elevation. The stack room is rather poorly lighted and the reading room would have been better separated from the delivery by a screen, in order that the attendant might have full view of it from the counter. The plan is somewhat extravagant in the amount of wall taken to enclose so small an area. The elevation is very pleasing and consistent, its chief defect being the window in gable having its label mould round and its upper part apparently filled with solid stone work. The rendering while somewhat effective is rather indefinite.

"The Last."—In this plan the accommodation for books in the stack room seems inadequate and it has the great objection that there is no simple method which could be adopted to enlarge the room without impairing the appearance of the building. If the stack room had been placed in the centre of the rear, it could then have been extended indefinitely at any future time without affecting the general design. The space given for delivery of books would be found small and the librarian or attendant has no way to enter the stack room, except by opening up the delivery desk which would be extremely awkward. It would be almost impossible according to this plan for the attendant in charge to have any supervision to the reading rooms. As regards the elevations a most objectionable feature is, in the building of a classical character, to have windows inserted of a design more suitable for an Elizabethan residence and the main entrance door also is hardly in keeping with the rest of the design. The heavy projecting cap to the base course is a detriment; a better scheme would have been to have made a slightly projecting course under the columns and the plinth at the ground level course. The rendering is fairly good but more care should have been taken, particularly in the elevations, to indicate detail, such as the balusters and parapet and the consoles of the main cornice. If the author of this design compares these details with any standard examples, he would see how defective they are. The lettering in this design is also rather sketchy for a competition drawing.

"Kohinoor"—The general conception of this building is suitable for its purpose. There is an attempt to make a good plan, but the plan is defective in that the delivery room, between entrance doors and counter, is too cramped in comparison with the vestibule, and in that the rear ends of the reading rooms do not adequately balance the front end of these rooms. This latter awkwardness has arisen in attempting to make a symmetrical side elevation enclose an unsymmetrical plan. The plan of the front wall and stack room are much better. The arrangement is suitable for the working of the library but the stack room is about 40% too large for the volumes specified. The elevations are good, being, relatively, much the better part of the work. Larger paper with line borders would have greatly improved the appearance of the drawings. A margin of ¾" on one side of a sheet and a full 2" on the other side is an injustice to a drawing. The mechanical line work of the rendering is fair, but there is great room for improvement in the freehand work. The washwork of the surroundings of the building shown on front elevation could be very greatly improved. A safer method for one with "Kohinoor's" experience would be to show the rendering of trees in large masses after the manner of "Mic."

"Max" is a good design in some respects but is more suggestive of a court-house than of a library. The plan is defective in the following particular: From the side elevation one would have expected a room the whole width of the wing, as the central window is the the largest of the three, but, on consulting the plan, we find two rooms across the end—a reading room and a lavatory—with unequal sized windows in the end of the reading rooms. "Max" should not have erred in this, as the rest of the work, especially the handling of the dome, shows better knowledge. The elevations are good, but the spacing of the columns at entrance could be improved. The line work of wash drawing is fair, but the brush work shows evidence of haste.

"Queen City."—The general conception is much more complicated than was implied in the conditions. No mention was made in the programme of art museum or of librarian's apartments. The plan lacks in pronounced architectural character, which the problem permitted. The stack room is badly lighted. Supervision of reading room by attendant at lending desk is impossible. Elevations are stiff. The large windows in the side elevations are poor and badly out of scale with the rest of the work. Arrangement of drawing is fair. Rendering is hard and the clouds are badly drawn and would have been better omitted.

"Rex." The plan is poorly handled. The main object seems to have been to get a central circular hall for delivery room at all costs. One would have expected a circular motive in the roof over this delivery room instead of a square one as indicated. The plan of the stack room is bad as the side of it is bowed to the right merely because the rotunda wall projects into it at the left, and because the windows are put in to balance the reading room windows on the elevation instead of to properly light the stacks. "Rex" has erred in thinking a reading room and stack room may, logically, have the same external expression. The entrance is the best part of the whole plan, but sliding doors in same are not practical. The stair to basement is badly handled. The general effect of the elevations is better than the architectural detail and rendering. A good honest line drawing is much better than "Rex's" spotty and indefinite method of rendering. Fewer surroundings and the omission of badly drawn figures would have been safer in the case of one with his experience.

"Ha Ha."—The design has the merit of simplicity, and the desire to give the building the character a Library ought to possess. The plan, while it is formal in general outline lacks that recognition of axes that is essential in work of a monumental character. The attempt to secure complete supervision is successful, but on the other hand, the stack room is poorly lighted, and the lavatories are badly situated.

The design would be more successful if brought into harmony with good monumental work both in planning and elevation and if more study were given to proportion and detail.

"Utility"—"In this design the librarian is too far from stack room and has not a sufficient supervision over the reading rooms. There should be a room in connection with the stack room either on the same floor or in basement for "mending"; the plans are carefully drawn. The elevations would bear more study; the omission of a frieze and the enormously large windows are detriments; the design would have been better with less ornament; the parapet as well as the wall below lacks continuity. The idea followed in the rendering is not at all bad.

"Alpha."—The author of these drawings has produced a design which calls for much praise, and which possesses a great deal of interest and charm arising from the directness and ingenuousness with which he has handled the subject. The general treatment however, both in plan and elevation seems inadequate for the purposes of the building. The reading room, containing as it does, accommodation for all the readers, men, women and children, and for the books and catalogues as well, is hardly appropriate in a library of 10,000 volumes, although it must be acknowledged the matter of supervision is much simplified.

The elevations are simple, direct and effective, and like the plans are unpretentious. The rendering has may good qualities, is unaffected and appropriate.

"CAMBRIA."—This library possesses the merit of being one which could be built at small cost. The elevations are below the average both as to design and rendering. The arch over front entrance is weak in appearance. The stack room should have direct light for all the aisles between the stacks.

"MONU MENTAL."—This design has been conceived in a somewhat extravagant spirit, the stack room being very large in area for the accommodation obtained. The attendant at the delivery desk has practically no supervision of the reading rooms, and the catalogue and reference room rather fills voids in the plan, than composing well with the workable arrangement. The dome as shown in elevation is inadequately expressed on plan. The elevation is extravagant in conception with the dome superimposed without adequate reference to anything underneath it. The elevations are rather crudely rendered, the accessories such as sculpture, carving and landscape, being rather bad.

"TOUT A VOUS."—"Tout a Vous" has a good plan, the main defect being the Librarian's obstructed supervision of the rooms (see criticism of "Mic.") The connection of the reference room with stack room was well thought out. It is questionable whether a recreation room would be of any service, as being entirely away from the attendant there would be great difficulty in controlling the frequenters. The proportions of the exterior are satisfactory and the general design is good, though the running of the large piers up through the cornice creates a lack of cohesion at that part and the arches over the cornice above the small windows is very unsatisfactory. The rendering of the side elevation is rather better than that of the front; the printing is neat. The drawings would have looked better with a more liberal amount of paper.

MR. JOHN GEMMELL,
President of the Ontario Association of Architects.

"MONSIEUR."—"Monsieur's" plan has much to commend it, the position of the delivery and reading rooms being generally speaking, well arranged with reference to Librarian's desk and the stack room has the necessary mending room easily accessible. The plan is a little pretentious for a 10,000 volume library, and had it been curtailed, bringing the stacks closer to the attendant, it would have been a better plan. The elevation having so much blank wall space would have been improved by having a better proportioned cornice. The outline of the dome could be improved—in fact were the author to set up a perspective he would be surprised at the manner in which the dome would disappear. It would have been better to put windows in the reading rooms at the front and the windows in these rooms should have had their sills much nearer the floor.

"CRESCENT."—The author of this design disregarded one of the rules of the competition which states that drawings are to be made to an eighth scale. The plans in this design are presumably to a sixteenth scale, although no indication is given by which this may be determined. Generally speaking the plan and elevation have much merit and the author would have done well to have given a little more study in order to bring them to greater perfection. This plan has the defect of others in not giving the librarian in charge sufficient command of the reading rooms. Too much space has been devoted to stairways and we think it would have been better to have enlarged the floor area of the stack room to make it more in keeping with a building of this size. The general proportions of the front elevation are very good, but the rendering exhibits too much haste. The two single trigylphs over the columns at the entrance would be better omitted. With more care in the details and general rendering, this design would have stood much higher on the list.

"REX NO. 2."—This competitor, as stated in connection with his drawings, is a student of only eleven months standing. Quite apart from this fact the design is worthy of great praise, and in view of the draughtsman's short experience is really remarkable.

The design as a whole bears the stamp of its purpose, is quiet and dignified, and of good working quality.

The plan is handled in a thoroughly monumental manner. The treatment of the approaches, entrance and rotunda are excellent. The plan would be much improved, considered from a strictly architectural standpoint, if the size and position of the librarian's, and catalogue rooms, &c., were altered, and the centre line of the wings horizontally were made the axes of the reading room.

The stack room is well planned in its arrangement and lighting. Technically speaking the element of supervision has been well worked out.

The elevation is very good indeed in respect of its general design and proportion, but it is undecided in detail. The treatment of the entrance requires more study, as also does that of the windows, but the work as a whole is on right lines.

The rendering, while it shows inexperience, is quite acceptable. The background of trees is simply but effectively indicated.

[EDITORS' NOTE.—The publishers of THE CANADIAN ARCHITECT AND BUILDER wish to express their satisfaction with the result of this competition, as well as their thanks to the Committee of Award for the time and care bestowed upon the work of the competitors.]

ONTARIO ASSOCIATION OF ARCHITECTS

PROCEEDINGS OF THE ANNUAL CONVENTION.

The President: Mr. W. L. Symons opened the Convention by calling on the Registrar to read the minutes of the last Annual meeting. The Registrar explained that as the published proceeding gave a detailed report of all that transpired the minutes had been shortened as much as possible.

Mr. Gregg then read the minutes which were adopted.

The President's addres followed.

PRESIDENT'S ADDRESSS.

Members of the Ontario Association of Architects in your 16th annual convention assembled:

In my address to you to-day I shall not dwell on the growth and work of our Association during the past year, as you will have evidence of these in the various reports to be presented to you this afternoon, the discussion of which will fully bring into view our year's progress. Truly our own affairs are of the greatest importance to us as an Association; but there are matters that concern us, taking issue in the world about, of which as architects we should take a much closer view than we are inclined to, under the strain of our ordinary business responsibilities.

A succession of prosperous years has probably reached the climax in 1903. This year has been of unexcelled prosperity in our Province and throughout our Dominion. Every branch of trade, without exception, has enjoyed a measure of expansion beyond expectancy. New industries have sprung into being, older ones have greatly developed, and on every side the results of good times are seen. The trades and manufactures with which we most closely come in touch, have probably never had such demands for their products, and in some instances contracts had almost to go a-begging.

Yet all this abundance and prosperity has left unanswered some questions at issue for years, which we promised that when the good times came, and with them ease, and time to think, some of these grim intruders to our feasts would be dealt with.

The most unsettled question which concerns the interest of Ontario to-day is undoubtedly the labor question. All remember the strikes last spring between the painters, carpenters, builders' laborers, marble cutters, steel erecters, and their respective employers. In fact, almost every branch of the trades with which we as Architects come in contact in a business way, was severely disturbed.

It is not necessary for me to dwell on the value of the work unproduced, or figure to you the loss to the workers or employers, or the loss to the public through the unfortunate disagreements, but instead to endeavor to propose a remedy, or at least to ascertain what other communities have done under like conditions.

The Legislature of New Zealand, in 1894, passed "The Industrial Conciliation and Arbitration Act." That law, which under the administration of the Minister of Labor, enacts that any society consisting of not less than two persons in the case of employers, and seven in the case of workers, lawfully associated for the purpose of protecting the interests of the employers or workers respectively, may register as an "Industrial Union."

The Act created Boards of Conciliation, as well as a Court of Arbitration, to which Unions became subject upon registration.

New Zealand, for the purpose of the Act, is divided into Industrial districts. Each district is given a special Board of Conciliation, which has jurisdiotion for the settlement of industrial disputes arising within that district only.

This Board consists of five, or such unequal number of members as the Governor may determine, elected for three years, the members being chosen in equal numbers by the respective unions of employers and workers in the district, and they appoint their own chairman. Industrial disputes of any nature may be referred to the Board upon proper application, and the Board is to carefully and expeditiously enquire into such disputes and all matters relating thereto.

The decision arrived at takes the form of an agreement, to which the disputants are made parties, and upon signature, is filed in the office of the Department of Labor.

In case the recommendation is not accepted, the whole matter may be referred within one month to the Court of Arbitration for final adjustment; if not so referred, then the Board's recommendation becomes operative and enforceable in all respects as if an agreement had actually been made.

The Court of Arbitration is composed of three members appointed by the Governor, one on the recommendation of the employers' union, one on the recommendation of the workers' union, the third being a judge of the Supreme Court, who acts as president. The members of that Court also hold office for three years.

The award of this Court is to be given within one month from the close of the hearing. If any party, on whom the agreement or award (as the case may be) is binding, commits a breach of the agreement or award, the Court has the full and exclusive jurisdiction to enforce the same, as provided in the Act.

The Act also particularly provides that when an industrial dispute has been referred to the Board of Conciliation neither party to the dispute shall take part in anything of the nature of a strike or lock-out, but the relationship of employers and workers shall continue uninterrupted by the dispute. Any persons not observing these provisions of the Act can be treated as offenders.

That Act seems to have been generally accepted, as we find that the number of disputes adjusted under it during the first six years of its operation amounts to 205, of which 44, or over 20 per cent., relate to building trades.

In the year 1901, 103 awards were made, of which 16 dealt with building trades; in the year 1902 the number increased to 225, of which 30 were in the building trades. The returns for 1903 will show a still greater increase of references, thus showing the popularity of the measure.

In 1901 the New South Wales Legislature appointed a Royal Commission to examine into the labor dispute question generally, and Judge Backhouse, who was made one of the Commission, in his report says:—

"The Act so far has been productive of good; it has prevented strikes of any magnitude, and has, on the whole, brought about a better relation between employers and workers than would exist if there was no Act. It has enabled the increase of wages, and other conditions favorable to the workingman, which under the circumstances of the Colony they are entitled to, to be settled without friction and bitterness of feeling which otherwise might have existed. It has enabled employers, for a time at least, to know with certainty the conditions of production, and therefore to make contracts with the knowledge that they would be able to fulfil them; and indirectly it has tended to a more harmonious feeling among the people generally,

which must have worked for the weal of the country."

And the learned judge ends a very exhaustive report by saying:—

"Whatever may be the result, the world owes a debt of gratitude to New Zealand for having undertaken the task of demonstrating whether it is possible or not to settle industrial disputes by compulsory arbitration."

Enactments bearing upon this subject were also passed in South Australia in 1894; in Western Australia in 1900, and in New South Wales in 1901, but up to this writing I have been unable to procure copies of those Acts.

In July of last year a bill was introduced in the Parliament of the Commonwealth of Australia, based upon all the Acts mentioned, which however is not yet law. That bill dealt with the matter possibly in a drastic manner, by giving initiative powers in the public interests to the President of the proposed Court of Conciliation, who would be a Justice of the High Court of Australia.

Comment on this bill would not be pertinent at this stage, and I only mention it as showing the importance which is being attached to the problems in the antipodes. I may be pardoned, however, in mentioning the point, which is shown up clearly by that bill, namely,—the existence of a third interest, being that of the public, which is not always borne in mind in the discussions.

In Great Britain, as far as I can ascertain, labor disputes are dealt with by what are termed "Permanent Voluntary Boards," those bodies are organized in any labor district, and can consist of any equal number of representatives elected for a term of years from among the workers and employers interested, who, together, elect a chairman.

Such organizations are not in any way under the Government control, or of the federation of either labor or employers, thus acting entirely independent of both. After the hearing of the case an agreement is drawn up embodying the terms reached, which, if accepted, is signed by the parties interested, and which does not require the consent of unions.

During the year 1902 some 678 industrial disputes were successfully dealt with in Great Britain by this means.

Attempts have been made by the Ontario Legislature to find a remedy, but those attempts have hardly been met in the spirit in which they were passed.

As far back as 1873 "The Trades Arbitration Act" was passed, and again in 1890 "The Trades Dispute Act." Both laws, I understand, are still in force. Why they have not been taken advantage of is hard to say. They are certainly voluntary in their character; and if Voluntary Boards are feasible here as in Great Britain, the suggestion of their foundation is to be found in those Acts. I would point out, besides, that Voluntary Boards were always available, and needed no impulse from the Legislature; yet though that impulse was given, no heed was taken of it. When two parties to a dispute want to agree, then a means of settlement can readily be found; but apparently in nearly every instance within our memories the desire to settle has been absent, attributable, possibly, to outside influences.

In 1902 the "Trades Dispute Act" was amended by giving the Registrar of Labor an opportunity of intervening in disputes upon request; and it is pleasant to notice that in that and the following year some 25 troubles were settled in this way—but none of them in connection with the building trades disputes in Toronto last spring.

A bill to create a Provincial Board of Conciliation and Arbitration was introduced into the Legislature of Ontario last May by the Minister of Labor, but did not get beyond its first reading. The bill is a mild form of the New Zealand Act, and though not far-reaching enough in its scope, would have been a step to successful legislation.

In concluding my remarks on this important subject, I would suggest that our Association make known to the public its views on the matter, as we are considered to be among the best parties to propose a means of settlement; in so far, at all events, as the building trades disputes are concerned; which bodies, I may say, comprise about one-third the membership of the local Unions. The public recognizes that no industrial disputes are so detrimental to trade and commerce, as a whole, as those occurring in the building trades, and we as a body, being brought into such close touch with those trades, can properly advocate some means by which disputes of this character can be avoided or adjusted.

After careful consideration my own opinion favors the adoption of some such Act as that in force in New Zealand, adapted to our conditions, especially as that Act is creating an atmosphere of confidence and trust between the workers and their employers that possibly cannot be found to exist in any other country.

I take it that the system in vogue in Britain cannot be adopted here with success, as members of a Union cannot act independently of the Union; and from the circumstances also, that reference has frequently to be made by the local Unions to higher governing bodies, some of which are in foreign countries—possibly because our workers are more transient than in the old land.

The control of Labor Unions from a neighboring republic (however little or much it may be), especially in the interference of labor bosses and walking delegates, is to be deplored, as it completely blocks the way to the use of independent means of conciliation; creating a spirit of unrest and suspicion amongst workers, and antagonizing the employers at every turn, thus frustrating possible good relations between the disputants that would lead to harmony.

I would particularly refer to the position of the so-called third party in this question—that is the general public. That certain questions of vital importance to the public, for instance where food, fuel, communication and transportation are concerned, should be left in the hands of an organization over which there is no control, is not to be tolerated, but ought to be safeguarded; and however far any future Act may fall short in its power to settle any particular trade dispute, it should give no uncertain sound when such momentous questions are at issue. The Ontario Bill of 1903 proposed to deal with this aspect, but, as I have said, that bill is not yet law.

The great demand for both commercial and residential buildings, consequent upon the prevailing good times, has given us an opportunity to show in a practical manner where we in Canada stand in the realm of modern architectural practice.

Several important buildings have been erected in our larger cities, and they show careful study both in plan and general design; in fact, for the amount of money expended they cannot be surpassed on this continent. I have been repeatedly told by both British and American travellers, whom I personally knew to be capable of judging, that they were surprised to see such results in design and construction for the sums expended.

With regard to our residential work, I consider, too, Canadians stand in the front rank. Our architects have so studied both the convenient and artistic in ordinary house planning that even our mother country may pause to consider.

But there is one point we should guard against, that is the tendency of nearly all our work to be Americanized. Personally it is the only thing I deplore in our Canadian art; whether it is really having too much to do, or whether it is indifference (it certainly is not lack of ability), but the bulk of our work borders on plagiarism.

"I appreciate the fact that our needs commercially and socially are much on a par with our neighbors, but there are factors in our national and private life and our institutions that demand our impress. Why we should design and plan certain classes of buildings on the same lines as a foreign nation I cannot see.

I do not so much object to Carnegie money for our free libraries, but I do most strongly object to that money being clothed in American art on Canadian soil. The younger men in our profession are doing good work; some markedly so; and it is to such we particularly address this word of warning.

Every endeavor should be made in art schools and architectural classes to foster unconscious individuality that will master for itself our everyday problems, and clothe our needs in our own designing, in our own materials, and with our own tools, that all we do may bear our very own impress.

I feel that the past year has developed an excellent spirit among the members of our profession, no doubt greatly due to the social intercourse we enjoy through the local chapter. That this will lead us to uniting ourselves in the greater interests of our profession is devoutly to be hoped for.

Well we know we have a great country and a great people, and we, whose prerogative it is to hand down to posterity our nation's thoughts and aims "in imperishable stone" can more faithfully do so by unitedly aiming for greater results in our educational work and our social intercourse.

"Gentlemen, I thank you for the honor you have conferred upon me in electing me your president for the past year. The members of the Council have been most unselfish in their attendance to the duties devolving upon them, and have given unstintedly of time and thought to the Association's welfare.

Mr. Denon oresented and read the Treasurer's report as follows:—

TREASURER'S STATEMENT, JANUARY, 1904.

RECEIPTS.

Fees	$335.00	
Rent for Rooms	67.50	
Advertisements in Proceedings	703.74	
Interest accrued 1903	26.60	
		$1,132.84
Bank balance from 1902		1,001.08
		$2,133.92

EXPENDITURE.

W. R. Gregg, Registrar	$100.00	
Registrar's petty cash	25.00	
Rent	112.50	
Convention expenses	171.06	
Engrossing minutes	3.75	
Office supplies	30.50	
Printing	7.00	
Journals	24.05	
Books for library	37.65	
Gas account	8.85	
Insurance	5.53	
Engineers (common expense)	40.88	
Window shades for hall	6.00	
Membership Canadian League for Civic Improvement	4.00	
Membership American League for Civic Improvement	2.00	
Printing Proceedings	229.50	
Reporting Proceedings	58.60	
Postage on Proceedings	30.55	
Commission on advertisements, 1902	19549	
Commission on advertisements, 1903	206.75	
Educational work	38.20	
Examination expenses	15.00	
Solicitor's fees	25.00	
Discount on cheques	.45	
		$1,378.31
Cash balance		755.61
		$2,133.92

Mr. Denison: There are two items here of money paid to an agent for obtaining advertisements to be published in our report of the Proceedings for the year, and while they decrease the balance of the amount, we have been paid for two years during this year; I think about $800 will come to us for the advertisements that will appear this year, so that the report will be much better than it appears now. We paid out for last year $191.41, and for this year $206.75, both happening this year.

Mr. Denison moved seconded by Mr. Wickson, that the report of the Treasurer be adopted. Mr. Denison stated that the report had been audited and signed by the auditors.

Mr. Sidall: I have just one remark to make. I notice the amount of money spent this year for education amounts to only $38; I think the bare mention of that amount is enough to emphasize the point which I want to make. I think it is a very small sum to spend on the important work of architectural education.

Mr. Denison: I would like to say to my friend in reply that possibly he has not thought of the large amount of money we are expending on meetings, such as we are holding to-day and have held in the past, all of which is part of our educational system. We are having papers from eminent men, and these go into the hands of our architectural students. It is not such a small total as it would appear on the face of it. We have expended a great deal of money in publishing our Proceedings; the printing of them last year cost $229.50, a large proportion of which is for these valuable papers, which we look upon as a most efficient means of educating our students.

The President: I dare say we will hear something from the educational committee on this subject. If there is no further discussion I will declare the report adopted.

The President: I see Mr. Kivas Tully, our veteran representative, in the room, and I take much pleasure in inviting him to a seat on the platform.

Mr. Tully took a seat on the platform. (Applause.)

The Registrar's report was presented and read by Mr. W. R. Gregg.

REGISTRAR'S REPORT.

Membership. —The present membership of the Association is: Honorary members, 4; Toronto members, 34; members in other places, 34. Total, 72; one member more than in January, 1903.

A new rank was created by the Council in January, 1903, viz., that of Honorary Past President, and there were elected to this rank: Messrs. Kivas Tully, Henry Langley, James Smith and Joseph Connolly.

Meetings of Council. —The Council has met seven times during the year, with an average attendance of 6 members. These have all been Toronto members.

Students. —Five students have filed Articles in 1903, of which three are students in offices of

Toronto members, and two in offices of members in other places.

Five students presented themselves for examination in April, and of these four passed the first examination, one was allowed a supplemental in one subject of first examination and one passed the second examination.

Proceedings. —One thousand copies of the Proceedings were printed and distributed. A permanent mailing list has been carefully prepared in such a way that it can be revised and added to from year to year, and the volumes are mailed or delivered mostly by single copies to Societies and persons interested in architecture at home and abroad.

A number of valuable and interesting exchanges are received from other Societies in return.

Civic Improvement. —This Association in 1902 became a member of the American League for Civic Improvement, which was formed in 1900 in Springfield, O., and has held annual conventions in Buffalo, N. Y., St. Paul, Minn., and Chautauqua, N. Y., and will meet in 1904 in St. Louis.

The Ontario Association of Architects was represented by W. R. Gregg at the Chautauqua convention in 1903.

Three members of the Ontario Association of Architects assisted in the formation of the Canadian League for Civic Improvement in Toronto in February, 1903, and the Association has also become a member of this League.

Guild Bequest. —A Trust Deed has been prepared by Mr. W. D. Gwynne, the Solicitor of the Association, and signed and sealed, by which a sum of over $300 is placed in trust by the surviving members of the former Architectural Guild of Toronto, to be invested until the fund and accumulations shall amount to $400, after which the income is intended to be offered as a prize to students, this prize to be known as the Architectural Guild Prize.

A full copy of this deed will be published in the Proceedings for 1904.

Committees to Report. —Toronto Chapter, Mr. E. Burke; Month'y Meetings, Mr. E. Burke; Library and Rooms, Mr. A. H. Gregg; Editing, Prof. C. H. C. Wright; Publishing, Mr. John Gemmell; Municipal Building Laws, Mr. A. F. Wickson; Legislation, Mr. J. A. Pearson; Membership, Mr. A. R. Denison; R. I. B. A. Examinations, Prof. C. H. C. Wright; Joint Association and Eighteen Club, Mr. A. H. Gregg; Educational Committee, Mr. A. H. Gregg.

The President: I think instead of presenting the report now, and discussing it, in order to save time, we will take up the reports of the several sub-committees. The first is that of the Toronto Chapter.

Mr. H. E. Moore, secretary, reported on behalf of the Toronto Chapter, Mr. Edmund Burke for the Monthly Meetings Committee; Mr. A. H. Gregg for the Library and Rooms Committee, Mr. Helliwell for the Editing Committee, and Mr. Gemmell for the Publication Committee. These reports were adopted.

REPORT OF THE MUNICIPAL BUILDING COMMITTEE.

Mr. Wickson presented the report of the Municipal Building Committee as follows:—

I do not know that I have anything to report. Although my draft by-laws were sent in there last January nothing has been definitely, that is, finally, done yet. I wrote to the Board of Control once or twice since Mr. Fleming was appointed, and I have also seen him. He told me just prior to the appointment of the City Architect that one of the first things he would do would be to take up this work. I am given to understand that Mr. MacCallum is devoting his time to that now, and I suppose before long we will come to a final discussion on them.

The President: We have been waiting for that since we were young in the profession—most of us.

REPORT OF THE LEGISLATION COMMITTEE.

Mr. Gouinlock: The chairman of the committee is not present to-day, but I might say that the Association did not deem it advisable to urge for further legislation this season, and they decided to leave the matter in abeyance for the present.

REPORT OF THE MEMBERSHIP COMMITTEE.

Mr. Denison presented the following report:—

I have nothing of special interest to report. Matters are just about in the same position as they were this time last year; but while I am on my feet I might say I was one of the representatives to the Technical School Board, Mr. Gray being the other. A new Board of Education has recently been elected and the old Board goes out of existence. Mr. Gray and I attended the meetings on many occasions and did what little work we could. I only hope the new system may be all right in its working, but so far as the Technical School Board is concerned I have my doubt.

Mr. W. R. Gregg: I would like to supplement Mr. Denison's remarks. He has really reported for two committees, the Membership Committee and the Technical School Board. With regard to the question of membership the Council slightly amended the by-law a year ago, giving them discretionary powers to admit architects who had not passed the regular examinations, if satisfied as to their general fitness and qualifications. We received one member under the amendment to the by-law. It still remains in the book, and it may be advisable to cast around the province and see if there are not other professional men who should be members of the Association.

Mr. Denison: I think that ought to be put prominently in our Proceedings this year, so that it will be noticeable.

The President: In the absence of Professor Wright, the chairman of the R. I. B. A., is there any person to report?

Mr. W. R. Gregg: The Registrar's report gave the number of students examined, and that is practically all. Mr. Taylor, the Secretary for Canada, writes, enclosing notice of the R. I. B. A. examination to be held.

MONTREAL January 4th, 1904

The Secretary Ontario Association Architects :

My Dear Sir:—I enclose notice of the next R. I. B. A. Examinations, to be held in June, and on behalf of the R. I. B. A., may I ask that you will kindly bring this before your Council as soon as possible, and that they will be good enough to give instructions, that all the members of the Association may be notified by circular of this Examination, for their own information and others.

The R. I. B. A. will greatly appreciate the cooperation of our Architectural Associations, in making these Examinations as widely known as possible.

I remain,

Very truly yours.

ANDREW T. TAYLOR.

Hon. Secy. for Canada, R. I. B. A.

The President: Possibly Professor Nobbs can give some information on this subject.

Prof. Nobbs: Mr. Taylor has taken up the points in his letter. Mr. Taylor told me himself that he is leaving Montreal in the spring, and the question of getting some one to take up the work is sure to arise. I thought Mr. Taylor would probably mention that in his letter to you. I am not a member, but my own feeling is it would be very desirable if your Association could see fit to take up the work of the Secretary of the R. I. B. A. examination, because I think you will have more R. I. B. A. students from Toronto than you are likely to get from Montreal. Another point is the feeling of the R. I. B. A., that if these examinations were held in South Africa and Australia, as well as in Canada, it should hold primary and intermediate examinations in addition to finals. That, of course, is a matter of arrangement for the R. I. B. A.

REPORT OF THE JOINT COMMITTEE OF THE ASSOCIATION AND THE EIGHTEEN CLUB.

Mr. A. H. Gregg made the following informal report:

On Oct. 30th, 1903, it was decided to form a Joint Committee, representing the Association of Architects and the Architectural Eighteen Club. Formerly classes had been held by both of these Associations for the students, and it was thought that by amalgamating much better work could be done. The Joint Committee is composed of three members of the O. A. Association and three members of the Eighteen Club. A mathematical class is held in our rooms here under the tuition of Mr. A. H. Harkness, B. A., who was formerly one of the instructors of the School of Science, and classes in design are held at the Central School of Art and Design. The mathematical classes were left to the management of the O. A. A. members of the committee, and the classes in design to the members representing the Eighteen Club. These classes a year ago were not well attended, but I think it is a proof that we are on the right lines, that the attendance is more than doubled this year. Last year the students in the mathematical class numbered seven, and I think the average attendance was much less than that. I have not a memorandum of the attendance at the classes in design, but I think it was very small, too. This year we have fourteen members in the mathematical classes, just double the number; and from all accounts the students display great enthusiasm in the work; and we have found it necessary to divide it into two sections, junior and senior. In regard to what Mr. Sidall has said about the amount of money paid out for educational purposes, our mathematical instructor receives a salary, but at the time of the last report very little had been entered in the Treasurer's report. Still, one of the main contentions of the committee was that we should have a professional man in charge of this class, and pay him properly for his services, and I think the result has proved our contention a just one. Mr. Harkness has taken a great interest in the class, and has been the means of arousing a great deal of enthusiasm, and I think the result will be a large attendance at our examination this year, and in a few years these younger members of the profession will be becoming members of our Association, and having gone through our regular course, should prove a most valuable addition to our Association.

The President: We have heard the report of the Toronto Chapter, the Municipal Building By-law Committee, the Library and Rooms Committee, the Legislation Committee, the Membership Committee, the Registration Committee and the report of the Educational Committee. I would like to have an acceptance of these reports moved and seconded, and we will discuss their adoption.

Mr. Gouinlock: I have much pleasure in moving the adoption of the reports as presented.

Mr. Burke: I have much pleasure in seconding that motion. Carried.

NEW BUSINESS.

The President: Under this heading I would like the Registrar to read a letter received from one of our out of town members.

The Registrar: This letter is from a member in Ottawa, Mr. Alexander, of the Department of Marine and Fisheries; he was one of our charter members.

Ottawa, Dec. 6, 1903.

To W. R. Gregg, Esq.,
Registrar O. A. A.

Dear Sir,—In regard to the convention I would feel much pleasure in being there, as my interest in the aims and objects of the Association has never lessened since our organization began; and if all has not been attained which we have sought I would regard that as the reason for more determined future effort. In this connection I specially deplore the cessation of active steps to legalize the title of "Architect," as I regard it as vital to the future success of the Association, as giving the Association the necessary control over its members in all professional questions of a practical, and ethical character; without which it seems to me impossible to bind men together in mutual sympathy.

Again, I know of Architects who have dropped their membership in the Association because of its being run so much as a Toronto institution. This objection I hardly sympathize with, but rather feel grateful to the Toronto members who have so unselfishly devoted valuable time to the Association; but I regard it as a fair question whether the utility of the Association would not be furthered by the annual convention being held in different large business centres yearly.

With every good wish for the Association, I am, dear sir, Yours very truly,

Fred. J. Alexander.

The President: This letter of Mr. Alexander's touches on two points—legislation and the question of the advisability of holding our annual meetings in different cities over the province. In regard to the question of legislation I do not think it is desirable to bring it up, as it is in the hands of a special committee, and we have their report, but as you think about that; however, I think it would be well to discuss at this meeting the advisability of holding our conventions east or west of Toronto; and I think in deference to our outside membership we should make a pronouncement, and seriously consider it, so as to be in a position to answer letters fairly written as this has been.

Mr. Gouinlock: In speaking of this proposition or scheme, to hold annual meetings some other place than Toronto, it seems to me there are so few architects in the various places in Ontario we couldn't undertake to carry it out successfully. We have discussed this before, and no city would undertake to carry it through. Unless the proposition was from the architects of Ottawa, or Hamilton, or some such place, I do not see that we are in a position to move in this matter.

Mr. Munro: I am sure I would be pleased to see a move made in that direction; for myself, I think we meet here in Toronto, in the Association's rooms, probably to a greater advantage than any place else; but what I think might be done is a midsummer convention, or something of that kind, to be held in different outside towns. In Hamilton there are probably fourteen or fifteen men practising architecture, and some of them were formerly members. I do not know that I can say anything further. I would like to see a convention in midsummer in Hamilton.

Mr. Simpson: What strikes me is this. If it is so difficult for this gentleman to leave Ottawa how much more would be it be for the number from Toronto to go to Ottawa. I very much like the suggestion of an excursion to some of these outside places in the summer. However, I think that it ought to be on the invitation of the architects of the city we visit.

Mr. W. R. Gregg: Would it not be well in replying to Mr. Alexander's letter to suggest that he inaugurate a movement in that direction among the Ottawa architects, and some sort of excursion, if not the annual convention, might be made to Ottawa. There is a great deal of interest there to architects, and it may be the means of more architects there joining the Association.

Mr. Sidall: I agree with what has been said by the members who have already spoken on this question. We have discussed it before; I think that on the first day of our proceedings last year the very same sentiments were expressed, and I believe we all agreed that it would be a nice thing and a very helpful thing. The trouble is it would be very difficult for so many to leave Toronto to meet so few in another city. However, I feel that something along this line could be arranged for, and I will move that that letter be handed over to the Legislation Committee with that object in view.

The President: Might I suggest the Membership Committee?

Mr. Baker: I have very much pleasure in seconding that motion. I think I had the pleasure of bringing that subject up last year for discussion. I see that the membership of Ottawa and Kingston, combined, is 7, and that of Hamilton and London, combined, is 6; it means to me that London and Kingston are the only two places where the convention could be held to be central, Kingston taking in Ottawa and Peterboro and towns in that part of the Province, and London taking in the towns in their part of the Province. I think something must be done if we are going to increase our membership. I think there are more than 70 practising architects in Ontario, and that there are nearly that number in Toronto. I think nothing further can be done than refer it to the Committee.

Mr. Simpson: Might it not be well to suggest in replying to the letter that the Association would be glad to consider the question of forming an Association Chapter, on the occasion of such a visit.

The President: I might say that the annual convention of the Quebec Association of Architects, at first held only in Montreal, is now held, alternately, in the cities of Montreal and Quebec. When down there I inquired as to the result, and they said it had been a wonderful success. Meeting in these two large centres has been conducive to a great increase in their membership, and in the general tone of the profession in that Province. The membership of the Ontario Association of Architects shows that we have a local membership of 34, and a non-resident membership of 34; and it seems to me now that we ought to pay some attention to this matter, possibly it can be best done through the committee that Messrs. Sidall and Baker suggest, and I will therefore put to you the resolution of Mr. Sidall, that this letter and correspondence be referred to the Membership Committee, and that they reply to the writer, having heard the sentiments of the Association.

Mr. Sidall: I still have the matter of the education of our students in my mind, and I think that some efforts should be made. Our own education has perhaps gone beyond the rudiments, but for the sake of coming architects I think we should do something more than we are doing now. I think we are on the right lines; the prize that has been offered, or is about to be offered to students of a travelling scholarship, or some other incentive to study, is a move in the right direction; but I think that during the coming year some further effort should be made. It seems to me we have money in hand which might be used for that purpose, and I would like, if the architects present agree to the sentiment, that it be taken up more enthusiastically than at the present time.

The President: It is vital to our Association and I would like to hear a full discussion on this subject.

Mr. Denison: I was out of the room, unfortunately, at the time Mr. Sidall made his remarks, but it occurs to me, and it has always seemed to me to be strange that the architects should be expected to pay for the education of their students. I think it is the duty of the Government. In every other profession and every other calling in life the Government makes provision for education; and we have received probably the least support of any body of men in Canada to-day. There is nothing, surely, so important as architecture in the building up of a new country. There is nothing that shows what any country is capable of to the extent that architecture does. But the Government seems to think that anything is good enough as an architect, and they do nothing for us.

Mr. Sidall: There is an old saying that if you want a thing done you should do it yourself.

Mr. Denison: It looks like it.

Mr. Baker: We might hear something about the President's scheme for scholarships; at the beginning of the term I understand that was all cut and dried, but in his report we hear nothing about it.

The Registrar: I would like to draw attention to the fact that the first step has been taken in the matter of scholarships or prizes. That is to say, the Toronto Architectural Guild Fund has been put into shape. The fund was originally $400, but through the loss in the Farmers' Loan Company it is now between $300 and $350, and it has there got to remain until the interest or the liberality of some friend brings it up to $400. When this fund amounts to $400 the interest goes for the first prize ever offered by the Ontario Association of Architects; it may be a prize in books, or a medal, I don't know just what it will be, but if we ourselves contribute a small sum and bring it up to $400, it means there will be a prize.

Mr. Gemmell: Is there anything to prevent the Association bringing it up to $400 without waiting for the interest?

The President: No.

Mr. Gemmell: If I might be allowed I would move that a portion of the Association's funds be used for that purpose.

Mr. Sidall: I second that motion.

Mr. W. R. Gregg: I do not feel quite so despondent as Mr. Sidall does about the educational work of our Association. We have very good classes now, and we have taken a great deal of trouble to prepare suitable examination papers to test the ability of the students, and I believe this year we shall have students coming all the way from Winnipeg and Port Arthur for examination. As the interest grows we may expect more, and all that is necessary is for each individual architect to encourage students to take advantage of these classes.

Mr. Burke: The hour has now arrived for another session, and a large number of visitors are here. Would it not be well to adjourn this discussion and put it in some time to-morrow morning?

The President: I think that is quite in order. You must remember that Messrs. Baker's and Sidall's motion is before us, namely, "That the fund known as the Architects' Guild money be increased to $400." We have with us this afternoon Professor Carpenter of Cornell University, Ithaca, whose name is a household word to us in Canada. The professor may not be aware of that, but if he knew how we, as practical architects, value his works, which are in our Library here, I think he would feel that his life work had not been in vain. Without further preliminaries I will introduce to you Professor Carpenter of Cornell University. (Applause.) I want you particularly to take note of Professor Carpenter's lecture, as Mr. Wright, who was to have led the discussion, is ill, and we shall have to depend for the discussion on the various members and friends present.

At the evening session, at which many persons outside the profession were present by invitation, Mr. Challoner presented a paper on "Mural Decoration," an abstract of which will be printed in a future number.

At the close of Mr. Challoner's address, Mr. Gouinlock said: I am sure we have all listened with a great deal of pleasure to the very able and instructive paper on mural decoration given to us by Mr. Challoner, and I have a great deal of pleasure in moving that he be tendered a hearty vote of thanks.

Mr. P. W. Ellis: I have much pleasure in seconding the motion.

The motion was put and carried unanimously and tendered by the President to Mr. Challoner.

SECOND DAY.

MORNING SESSION.

Wednesday, 13th January, 1904, 11 o'clock a.m., the President, Mr. Symons, took the chair and called the meeting to order.

The President: There were two items of unfinished business yesterday that I should like to dispose of this morning. One of these is particularly interesting to outside members, who are perhaps better represented to-day than they were yesterday; but there is still room for better representation. The motion was made by Mr. Gemmell, seconded by Mr. Siddall.

Mr. Siddall: Mr. Gemmell, who moved the resolution that I had the pleasure of seconding, is absent. As far as I understand the motion, it was that a sufficient amount should be contributed to make up the necessary fund to pay the scholarships for which there is part in the funds coming from the old Guild. That is the gist of the motion, although it may not be in identical terms.

The President: In regard to that question, it may not be out of place to make a few remarks. The Guild money, as most of you are aware, was not handed over to us until recently. The conditions have been agreed to and a document has been drawn up giving the Association control of these moneys; one of the conditions is that it shall not be used until it reaches the sum of $400. The sum is about $320, and this motion is that we increase this sum to $400 to make it available for the use of the students at once. The idea is that the interest derivable from this shall be competed for annually by the students of the Architectural Association, and the award be made in accordance with the wishes of the Council, such as a medal, or a ticket of leave or it may take such a shape as is thought best. I would like to hear it well discussed, because it will depend on what you do this morning whether it can be used for many years to come, probably six or seven.

Mr. Belcher: How do you hope to accumulate $400, even depending on the interest?

The President: We have $320, which will probably now be raised to $360, by another dividend which I understand will be paid by the Farmers' Loan Company, in which institution it was unfortunately placed. It seems to me that we have no way of increasing this to the limit, $400, unless from the funds of the Association or by compounding the interest. We are anxious to have this operative. There is nothing like a scholarship even if it is only the sum that we can command now. It is in order to give a little snap to our educational work, that the Educational Committee, who are really at the bottom of this proposition, wish you to consent to this this morning.

Mr. Baker: I am heartily in accord with the motion, and will support it strongly; but it strikes me it does not go far enough. I would like to see a little more done if we can. In the past I think we have erred in doing these things in too small a way. I will throw out a suggestion that it be raised to a sum that will produce at least $25 a year. I should think that might be arranged in some stock which pays an interest of six per cent., some solid company, an insurance company or something of that sort. That sum we might raise. I do not know how it would be controlled by the deed of transfer, but I hope the meeting will see fit to go a little further than providing a few dollars to make up the $400 which we have received in such a generous way from the Guild.

W. R. Gregg: This money that is given to us by the Toronto Guild was voted in the lifetime of the Toronto Guild; it has been arranged that the prize is always to be known as the Toronto Architectural Guild School prize. This does not prevent any number of other prizes being raised in the future; there might be a five thousand dollar investment made for another prize. The Council has a perfect right to change the prize from one thing to another; it may be books or it may be a medal; the trouble with the medal is that it would take a good deal of money to buy the die and we would have to keep the young men waiting a few years.

Mr. Simpson: They would die in the meantime.

Mr. Gregg: The credit has to go to the Toronto Guild. The money was $400, and it should have been $500 or $600, if the interest had been at six per cent., as Mr. Baker says. But it has to be invested at a low rate of interest, because it is trust money, and we have no more right to put it in stock than we would have to put any other trust money. It has to be the safest kind of an investment according to the agreement. I think it would be possible to make it up to $500, but the credit goes to the Guild. It should be kept in view that the old Guild gets the credit of the whole thing and if we add $150 we must give the credit to the Guild. The prize may be changed from a prize to a medal, but it always remains as the Guild prize or the Guild medal.

The President: Mr. Gemmell (who has just entered the room), we are speaking of your motion of yesterday to increase the Guild money.

Mr. Gemmell: I gathered from the few words our treasurer spoke of making it $500 and presenting it. I thought if the interest were put in, making it up to $400, it would be such a trifling thing for the Association to do and it would make the fund immediately available. Then there would be reason in calling it the old Guild fund, because it would be only a matter of $30 or $35 of other funds in the $400. I think I will stick to my original motion to

make it $400, so as to make the prize immediately available.

The President: Do you wish to make an amendment, Mr. Gregg?

Mr. Gregg: No. I was answering Mr. Baker. It is the Guild fund, a thing by itself.

Mr. Baker: No matter where it came from, it would be from the Association. It would be handed out by the Association like all scholarships.

The President: It is to be handed out by the Association, but it is to be known as the Guild Scholarship.

Mr. Gemmell: I think that $400 is quite an amount to grant, suppose it is to be donated for one special purpose. The Association has plenty of ways to spend their money and I think this particular Guild fund should be limited to $400 net.

Mr. Siddall: There is a way out of the difficulty, perhaps. It may be wise for the Association each year to make a grant and double the amount that the interest on $400 would produce which would only be about $20. If the Association were to make a grant of a like sum each year it would make a prize worth having. I think that if the amount is made up to $400 this year by the Association, it would be a prize worth having next year; and then the next year we would double that prize by granting the sum of $20 from the funds of the Association as an additional impetus to the students. I think it would be wise to go slow in the matter. This is a fund by itself; and it we wish to get another fund we can do so. As far as this particular fund is concerned, I think it would be wise to deal with it separately.

Mr. Simpson: I think the Ontario Association of Architects ought to have some idea what they are going to put this money to before they bind themselves down to any amount. I do not see what good $16 a year is going to do any student. We must have some idea what good can be done and then let us pass a resolution sufficient to cover the purpose we intend to put it to.

Mr. Gemmell: This fund is a thing beyond our control; it is established by this document which Mr. Gregg accepted yesterday, and must be used for that purpose, or the interest on it.

Mr. Baker: After this resolution is carried we may want to make the interest up to the sum of $25 out of the funds of the Association; that will only take a few dollars out of funds to make up the difference between $16 and $25. After this motion is carried, I will make a motion to that effect.

The President put the motion that the Guild fund, which amounts to something about the sum of $320, be increased to the sum of $400 by the addition of such necessary sum from the exchequer of the Ontario Architects' Association. Carried.

Mr. Baker: I would move that a sum be paid or set aside by the Association sufficient to bring the interest accruing from the Guild fund up to $25 each year.

Mr. Belcher: I have much pleasure in seconding that. It is a good plan.

The President: It is very pleasing to hear that seconded by an outsider; we are very anxious to have the support of our outside men. Carried.

The President: I think it would be well while we have so many outside men here to discuss the subject of holding our meetings in some other cities than Toronto, or, as was suggested, of holding a summer convention. We should like to hear a discussion on that subject this morning.

Mr. Baker: To bring the matter before the meeting I would move that the Council be asked to consider the advisability of holding a summer meeting in Kingston at a convenient time.

Mr. W. R. Gregg: This matter was disposed of in a way. The letter suggesting these meetings was handed over to the Membership Committee, which would report to the Council.

The President: We have quite a few outside members here this morning, and I would like to hear what they think of such a proposition.

Mr. Bell: Although I am a native of Toronto, I reside in Ottawa at present, and I know that there is a hard feeling in connection with the matter. I think the only way to overcome this difficulty and keep up the Association, as we would like to see it kept up, would be either to hold the winter meetings occasionally in the outside cities or have a summer convention, and probably the summer convention would be the better. It seems to me that about three places would do, London, Hamilton and Ottawa; Kingston, of course, is an older place, but it is such a small town that it does not class with Ottawa. My opinion of the matter is that something must be done, and I think the summer convention would be better. Probably that matter could be best discussed if left entirely to the Council and that is what I would suggest.

Mr. Belcher: I agree with this proposition; I am too conservative to upset the old Association by travelling about particularly in the winter. I think Toronto is a more convenient place to nearly every one, as far as Ontario is concerned. I think at the same time it might be well to have a summer convention, and especially for the students. And in consideration of the students I think it would be a nice thing it it could be arranged.

Mr. Bell: I belong to the American Society of Civil Engineers, and also to the Canadian Society of Civil Engineers. The American Society holds its convention during the summer and I have attended a great many of them during the last twenty-five years; I have found these meetings very useful for the purpose of bringing the members together and getting them acquainted, socially, especially. I think there is a feeling of something of that kind in connection with our Association, and something ought to be done.

Mr. Burke: I think, as far as the annual meeting is concerned, it would be enough almost to wreck a particular meeting to have it outside of Toronto; the majority of the Council live in Toronto and we have all the machinery here for our meetings. We have our rooms and our place for exhibition, and having had it for so long it seems it has got into a certain groove, and to take the annual meeting out of Toronto would be very serious. I think if we could manage a summer convention and have an interesting as well as a social meeting, it might be a good thing for the Association.

The President: I think we can safely leave this in the hands of the Council, especially after hearing from so many of the outside members. We have with us to-day Professor Nobbs, of McGill University, Montreal. He is to give us a paper on the subject of Delineation of Architecture.

Professor Nobbs was greeted with applause.

AFTERNOON SESSION.

When the convention reassembled, an address was delivered by Prof. Mavor, of Toronto University, on "Recent Developments in the Planning and Improvement of Cities in Europe nd America," and was followed by a paper by Mr. F. G. Todd on "The Advantages of a Park System."

The election to Council resulted as follows: Mr. W. R. Gregg, Toronto; John E. Belcher, Ottawa; and S. G. Curry, Toronto.

"THE DELINEATION OF ARCHITECTURE."*

By Prof. Percy E. Nobbs.

Mr. Chairman and Gentlemen:—Although I have always held that the practice of opening a paper with an exercise in apologetics brings those who employ this artifice for breaking the ice peculiarly under the ban of the old adage "Qui s'excuse s'accuse" I am constrained to take this occasion to apologize once for all to the Profession in Canada, to my future students and to any of the outside public who may find themselves obliged out of politeness to give me a hearing, for the assumption of a University Chair by one so wholly lacking in dialectic and oratorical skill as I. A ray of consolation comes to me however on reflecting how rarely the natural and artistic instincts are combined in one individual and it is to the latter that I pretend. The best of our profession in England at least are silent folk; in this I find comfort on such occasions as the present.

From this circumstance I would almost argue that architectural matters are not fit subject for conversation. I doubt if by spoken words any piece of work has been satisfactorily described by one man to another who had not seen the thing. No written description has ever conveyed the remotest resemblance of an architectural idea to me and I rejoice that when you did me the great honour of inviting me here we were able to select a subject which would not call for an effort at describing what must be seen to be felt, and this brings me to my first point, which is that a good drawing of an architectural subject is more eloquent of the beauties that be in wrought stone than all the poets and orators, and our business just now is to enquire that constitutes excellence in an architectural drawing—a question by the way of no possible interest to the lay mind.

It is almost unnecessary to remind a professional audience that architectural draughtsmanship is a new thing. So recently in the history of our art as the building of the Parthenon in 438 B.C. a set of contract drawings was a thing unknown, far less a set of client drawings and a perspective—the Gothic men drew badly, and when they did not just go ahead and build they used models by way of preliminary studies. The renaissance architects made moderately good drawings of old Roman remains but did not rely greatly on drawing for proposed works. Models were found far more satisfactory than drawings and it is only the cost that prevents their more frequent use to-day.

In the separation of the functions of the builder and the architect we have the real reason for designing by the indirect paper process to the extent we do; and this being a condition past remedy we do well to accept it and consider the draughtsman and his work.

Nothing has contributed more to the development of draughtsmanship than the recent revivals which have taken place of by-gone styles which have led to the study of old work by means of measured drawings--the only way old work can be studied. A secondary motive for good drawing may be found in the system of selecting an architect by competition which rages in England greatly I think to the detriment of our art and the debasement of the profession, but that is a matter beyond the scope of these notes. Sufficient but to point out how much competitions do to stimulate the skillful delineation of architecture if not the art itself.

We have then three main classes of architectural drawings: (a) Working drawings necessitated by our professional conditions and the unskilled and inartistic state of the labour market. (b) Competition and clients' drawings no less intimately connected with our professional systems than the working drawing and (c) Measured drawings and sketches which are pre-eminently works of study.

Owing to the way in which picture painting has monopolized the title of art even some architects have false ideas as to what a drawing should be. There are two ways of drawing a thing. From the painter's point of view it is not the thing that is beautiful but the appearance of it, as Mr. Ruskin and others have pointed out. Moreover his drawing of it is meant to be an end in itself, a thing imbued with some kind of beauty, and it is unnecessary here to analyze the many elements of beauty in painting. How different is the draughtsman's purpose! Who outside the profession cares for the finest elevation that ever was draughted? In the matter of labour and even in technique it may rival any painter's work but when the competition is lost or the building completed it has served its turn and to do this it is essential that attention be not wasted on an aspect of the building but upon the facts of the case. An architect may imagine his building in pale pink frosty sunshine or midday glare or silhouetted against an evening sky but as far as drawing the thing goes it is of no use to him or anyone else to represent it otherwise than as it is—so many masses related by proportions, contrasts, textures, colors. The style of drawing which most easily attains the object of representing a thing AS IT IS as opposed to as it may happen to appear is the best. Having thus made clear the object of the draughtsman, let us consider his materials and technique.

This we can do in a word. India Ink is, and I think will always be, the chief medium for the expression of architectural ideas. Fads for pencil, wash, or brown ink come and go but the preeminence of the great hexagon stick bound up in string is never seriously challenged. In the use of ink a great change has come about in late years. The thin fine line of the last generation has become a lost art, which is a pity, but not wholly to be deplored, for with it has gone the horrid practice of back lining by way of showing the shaded side of things. To-day the English architects draw with a stout line—often far too stout—sometimes a silly affectation, and the reason is a practical one as we all know. Tracers' eyes are not to be ruthlessly sacrificed. If the ink goes on strong and juicy one can get a sunprint through "Medium Whatman" while if reduced photo lithographs of our drawings are to grace the sympathetic professional papers what time we are "branded with the infamy of a second premium" as a sporting competition architect has styled it, then a thick clean and unrubbered ink line will stand us in good stead. Of course thick line drawing to small scales leads to all kinds of impressionisms on the draughtsman's part,—so much has to be omitted—a single line in the right place must tell that a three membered architrave is here proposed, while sculpture can only be indicated by dots, also in the right place. To draw well with a thick line even ½-inch scale is very difficult, and the mannerisms of the skillful are often attempted by the would-be smart draughtsman with deplorable result. A rather wholesome reaction in favour of more refined methods is setting in but the thick line has come to stay and the student should learn from the outset to use it, for by

*Paper read at the annual convention of the Ontario Association of Architects, January, 1904.

long use only can he discover the marvellously sympathetic qualities of thick black ink and white paper.

Especially is this so when we consider the double motive with which the student bends over his board. His success on the lower rungs of the professional ladder depends entirely on his being able to be of use in the draughting room while the only way in which he can assimilate any idea of what architectural details, or for that matter, anything else Architectural is like, or how big things should be, is by drawing them as they are,—plan, elevation and section, even of an acanthus leaf. That is the only way I know of becoming heir to the least morsel of the glorious heritage of tradition in our art.

Mr. Kipling has told us that there are "More than thirty ways of constructing tribal lays and every—single—one of them is right." The analogy which exists among the arts here breaks down a little. There are many ways of rendering Architecture and a great many are wrong, but happily we need only deal here with some of the right ways.

The remainder of this paper will practically amount to a comparison between the methods of the students of the R. I. B. A. and the Ecole des Beaux Arts in Paris and I venture to hope the meeting will agree with me that the ideal lies between the two.

Before plunging into technical questions of rendering it is worth while pointing out that a fashion in drawing is very apt to lead to a fashion in designing. I will challenge any man who has worked in an architect's office to look at some of the new buildings in Glasgow and not feel his nostrils assailed by the delicate aroma of tracing paper and seem to hear the rip of the pencil up the T square and the rattle of the sets. The technique pervading these and many more designs of the Art Nouveau adherents is not the rational technique of stone or even steel. It is the technique of the draughtsman and his tools not of the builder. It is as if a sculptor modelling in wax for bronze had forgot the nature of bronze in his enthusiasm for his wax.

Coming now to questions of practical draughtsmanship, the due relation of accuracy and speed must be considered. Inaccuracy is as inexcusable in a draughtsman as sheep killing in a collie dog. In the training of draughtsmen it is absolutely fatal to develop the over painstaking kind of drawing which encourages slow, I would almost say lazy, habits. It is here that method in setting about one's work tells. Accuracy and speed are not inconsistent in drawing any more than in whist and it takes both qualities as we all know to make a man worth a salary. This is an important point in considering methods of rendering.

As the object of all our drawing is to present a building as truly as possible in accordance with limitations imposed by scale and medium—ink, soft pencil or wash—we find certain conditions amounting to conventions imposed upon us which it were inartistic not to recognize.

An outline drawing in ink (such as is demanded by the conditions of most competitions in England) must of necessity ignore all question of local colour and shades and shadows and yet if it fails to convey the idea of mass it is wholly futile. The heavy lining in of the boundary lines of nearer masses and the thin lining in of all jointing are tricks which in inexpert hands lead to strange results, but a marvellous amount may be expressed by this means concerning the mass, texture and scale of the work. A great mistake is often made by giving undue prominence to the jointing while the practice of jointing little bits here and there is well enough on a working drawing but very distracting on a draught which seeks to show a committee or a client what is proposed, as there are no outlines of parts on a building as seen, and if we adopt the convention of showing the forms of things by this convenient means the jointing which is subsidiary and does consist of lines should be rendered with a line of very different quality--thin, in pale ink, or pencil, as opposed to stout lines to show form. Some beautiful drawings of Neo Greek work appeared a couple of years ago in the "American Architect" in which these principles were observed.

In making two lines do the work of three and express the effect of a moulding, a good deal of insight is often required. The practice of breaking the inner lines of a moulding has much to recommend it as long as it does not become a mere habit or trick instead of a means of expressing the several groups or orders or separate pieces of which a moulding is made up. To line in the top and left side of all panel moulds and leave the bottom and right side open, is a convention to impart shadow too crude to be encouraged. It is little better than the old back lining to my mind.

In lining in the freehand work of caps or the enrichments of mouldings, good steady penmanship, without variation in thickness is to be aimed at, for a drawing in line once started must be homogeneous or the different parts in close proximity will appear nearer or further according to the amount of ink lavished upon them.

The fashion of drawing all freehand work in with a tremulous or loose line on the ground that hand work should contrast with mechanical work and that error in a shaky line is not so apparent as in a clean sweep, has, I think been followed too much. I do not recommend any one who has the faculty for drawing clean to a small scale, to draw shakily on purpose—it might easily demoralize the sense for refinement in the scale of detail.

I have here a sketch of Beverley Towers lined in with a laboriously shaky line. There is much charm about the drawing; the effect is quaint and the value of things stunningly well attained, but supposing a man can sketch in the direct way that Mr. Blomfield did for his book on the "Renaissance in England" he should not affect the studiously shaky line in ink over a careful pencil drawing.

As draughtsmanship is one of the lesser arts in which individual style has really no great scope, we find extremes of mannerism manifesting themselves instead. The self consciously loosehanded style is well exemplified in the drawing of the famous font in Siena. There is a little too much sleight of hand and not enough sympathy for the peculiar character of cincocento carving to be thoroughly commendable, but the fact is patent that Mr. Fulton is possessed of a rapid and business like way of putting down approximate facts. This is an example of extreme, not typical English drawing, and it is unnecessary to say that no academic draughtsman can see much virtue in it, but your academic draughtsman errs quite as much the other way. When mannerism in draughtsmanship of whatever kind gets the

length of obliterating instead of sympathetically enforcing the differences between various subjects rendered, it is time to remember that there is such a thing as approximate truth which is not entirely compatible with meretricious affectations either in speech or drawing.

The drawings submitted annually for the various travelling studentships of the R.I.B.A., afford us excellent examples of English methods and these sets of measured work from Melrose Abbey, Houghton in Norfork and Aston Hall, Birmingham, will give some

MEASURED DRAWING, MELROSE ABBEY.—T. WASS.

MELROSE ABBEY—S. TRANSEPT.
From a Photograph.

idea of faithful rendering and good workmanlike methods of execution without undue affectation of technique.

Before leaving this matter of scale drawings in ink line it may be well to call attention to a few of the tricks of the trade which enable us to express, albeit in a conventional way, something of the interest that is in caps and carvings, and sculpture. When sculptured decoration is shown it is impossible really to give it its value by uncompromising line drawing, while if patched shading is resorted to we at once knock the pure line drawing of the architecture out of time. The draughtsman's method should be to draw the folds of drapery &c., more thoroughly on what may be supposed the shaded side, leaving the strongly lit portions in unbroken white. Cast shadows should be very sparingly employed and only where the line drawing fails to convey an idea of what is meant.

As to the crossing of ink lines at corners much difference of opinion prevails. When exaggerated, the tangle of lines quite defeats the object, which is to make it clear what is an arris and what a bead or moulding on a small scale drawing with thick line. When systematically practiced and not overdone the crossing of lines makes for rapid work and clearer meaning. I have known cases, however, in which a laborious draughtsman has gone over a drawing, crossing all his ends to give it a smart look—such second hand affectation needs no comment here. The unskillful draughtsman is very apt to draw far too much detail on a small scale drawing. We have all seen elevations in which the caps of Corinthian columns appear as so many black blotches while a delicate swag is made to tell with more force than a three foot cornice. As the scale gets smaller so should the amount of detail sought to be represented.

Turning now to full size details, I would here commend the use of the shaky line because it is much easier to hold to the true sweep of a curve with a loose than with a hard line. Full sizing should be learned by measuring off old work, for only so can the sense of the right scale of things which is far more important than their actual form be attained. For full-size details of ornament the softest pencils should be used—speed and

FULL SIZE DETAILING TO SHOW SINGLE HATCHING.
Percy E Nobbs.

sympathy are to be found in a 3 B. Every one will develop his own way of shading, but the advantages of point work are worth considering, and here let me say that shadows are not our business. To my mind architectural details are simply rendered misleading by the projection of shadows in the "Beaux Arts" manner. That is encroaching on the painter's prerogative to represent things not as they are but as they look or might under unlikely circumstances be imagined to look. To detail ornament then we must ignore all the cast shadows. The projection we purpose can be given by sections. The modelling of surface can only be rendered by shading, so let us adopt the most adaptable method of doing this. I have already said "shade with the point," and I must add and "do not rub the paper into a gray scumble." Clean single hatching is the fastest and most suitable of methods. Three ways of differentiating values are inherent in this kind of shading and they make for sympathy in rendering as well as direct and speedy excution: (a) By the wider spacing of the lines any degree of change may be attained. (b) By the use of heavier lines any tone can be presented. (c) By the direction of lines, flow of surface can be indicated.

The simpler and more direct the method to which a draughtsman confines himself, the greater dexterity will be attained in it. The intrinsic beauty of shading

outright once and for all with a single hatching is that so much transparency can be got into the shaded surfaces and with practice any degree of delicacy or violence in modelling can be distinctly set down.

I have here two interesting drawings by an old and successful rival for R.I.B.A. honours, Mr. Bennet.

CHARTRE CATHEDRAL—THE DOORWAY.
From a Photograph.

CHARTRE DOORWAY.
Wash Drawing by Mr. Bennet.

CHARTRE DOORWAY.
Line Drawing by Mr. Bennet.

In the pencil drawing we have things as they are, in the wash drawing things as they look. Suppose the thing were not in existence except in an architect's mind. There is no doubt about which of the drawings would lead to the better execution. The line drawing not only tells far more, but it required greater skill to produce. Blinded as we are by all pervading ideals of the picture painter, we are possibly more attracted by the wash drawing, but looked at closely, a photograph would give us as much, while no photograph could give what the less imposing line drawing conveys of how the effect is got to those who know. I am bound to say that in my opinion the wash drawing should never have been made. In technique it is far better than most of the wash work we see in water colour exhibitions and it is gratifying to possess a copy of it. Faithfully and lovingly it was done, but why should time and skill superior to that of the very carvers who did the original be lavished upon what any photographer could turn out. Mr. Bennet was a student both of the R.I.B.A. and the Beaux Arts and the happy circumstance of the two drawings in the two styles has suggested to me this comparison which I hope will lead to a discussion. As the Beaux Arts methods of draughtsmanship obtain in all the other Architectural Schools on this side the question is of great interest to me.

And here lest I be for a moment misunderstood let me say that my admiration for French draughtmanship is unbounded. These Prix de Rome drawings by students of the Beaux Arts speak for themselves. The delicacy, insight, knowledge and skill of the French draughtsman is something on an altogether different level from our rough English work and I can only envy him his clever fingers. There is much that the English draughtsman would do well to copy from his French brother, especially in the matter of showing nearer and further portions of a building in different strengths of drawing, though I think that scientific sciography is a mixed blessing in an architectural drawing. The French as a nation do draw better than we do, it is born in them more or less, and if our English architectural student were to be trained to the same standard of draughtsmanship I fear he would never learn very much architecture. Moreover when an Englishman draws at all well he is apt to let all other architectural accomplishments take care of themselves.

Putting questions of time and money aside, I am bound to state my own preference for the omission of cast shadows even on competition drawings, although I seldom leave a drawing raw from the inking in without putting in thin washes to emphasize or reduce the values of various parts. This conventional as opposed to scientific sciography is apt to tempt the draughtsman to make things look as he would like them to, not as they really would, but on the other hand the over scientific methods seem to spoil the scale of the drawing. The most important thing to realize from a drawing about a building is its size. The profusely shaded French drawing is apt to look so real on the paper as to suggest a drawing of a little model, not a flat drawing of a very big thing (for even a small house is a very big thing).

In a detail for Mr. Tapper's design for Liverpool Cathedral an attempt was made to render the plans of various parts by tones of color and without any sciography. The drawing was 7 feet long to ½-inch scale and I think a better idea was given of Mr. Tapper's huge conception than if the great masses had been broken up by cast shadows. Even in sketching the architect must ever pay more attention to the thing as it is than the thing as it looks, and I am often amused by the attempts of picture painters to render architectural subjects without searching into the real nature of such things as crockets and double ordered tracery and bed moulds of cornices. Many otherwise fine etchings and engravings fail adequately to get the spirit of architectural subjects simply for want of scholarship.

I have here three beautiful pen and ink sketches by C. E. Mallows, A. N. Prentice and Reginald Bloomfield. In all there is evidence of tremendous skill in epitomising things they know. It is only an intimate knowledge of English crocketed pinnacles that makes it possible for

Mr. Prentice in a few dots to get the very life and soul of St. Mary's, Oxford. Mr. Mallows indicates his brick and tile texture with that sympathy born of knowledge of the thing as it is as well as power to render it as

PEN AND INK SKETCH.—C. E. MALLOWES.

HIGH STREET, OXFORD.
Pen and Ink Drawing by A. N. Prentice.

PEN AND INK SKETCH.—REGINALD BLOOMFIELD.

it looks, while Mr. Bloomfield's dashing line might be envied by any pictorial artist to whom drawing is more than an incidental professional requirement. Perhaps the most brilliant English draughtsman is Mr. Joass who links the last generation to our own. An immense appreciation of details as they are, have combined with long and arduous practice to give him a felicity of expression which I can only describe as eloquence in drawing. An unfortunate result of his dexterity has been that in a thousand offices his every trick and mannerism is being imitated. It looks so easy to leave all the setting up lines in a perspective where they are and swim some vagrant washes of mellow colour upon a sheet of ochre tinted paper and thereby produce the solemn joyfulness of one of Messrs. Bodley and Garner's great church

A DESIGN BY MESSRS. BODLEY & GARNER.
Drawing by T. Joass.

interiors with its stately dossal and diapered altar frontal glowing in the amber light which percolates the the stained and traceried windows. As to free sketching however, to the architectural student I would say "beware how you sketch." The more the ego with the skillful hand is suppressed and the more the building with its peculiar qualities is felt, the better. We sketch to understand not to sell. I doubt if any man whose sketches have attained to any character and intrinsic beauty modelled his work on that of others. If a sketch is begun as it often happens with the preconceived intention of making it look like something we have seen elsewhere, the texture quality and colour of the materials to be represented will have a poor chance.

Peter de Hooch was in many ways the greatest of architectural renderers and though his technique is quite out of the question for practical purposes his spirit is wholly worthy of imitation. How he revels in the beauty that is in brick walls and tiled roofs and paved courtyards. Behind his painting of things as he saw them in golden evening light there is the knowledge of the thing as it is.

Before leaving this question of architectural sketching I should like to say that it is rather an ornamental accomplishment. Just the other day I was talking over some sketches at the R. I. B. A. exhibition with Mr. Prentice, and he rather surprised me by saying his Spanish sketches which are so justly famous were a waste of time and regretting that he had not measured more and sketched less while in Spain. It is after all by measuring existing work and by no other means that the student can get the real relation between the thing on paper and the thing in stone or brick.

I think I have now said and shown enough to make it clear that there is a distinctly English school of architectural drawing with characteristics of its own very different from the Academic or Beaux Art practice which has been adopted almost everywhere else. The besetting sin of the English draughtsman is affectation, but really fine originality is occasionally met with. The Ecole des Beaux Arts men on the other hand all draw so nearly alike that individual character has no chance. On the other hand their average work is far better than the average in England.

What I have said of French and English draughtsmanship holds equally of French and English architec-

ture. In France there is a school of work and a very high average of attainment; while in England there is no body of tradition. Every man works with such traditions as please him and he is not taught to make his selection. The result is a deplorably low general average redeemed, however, by a few really great men whose names will go down to posterity with the great roll of "those who fought and sailed and loved and made our world."

In closing, I should like to remind my hearers of the peculiarly subordinate importance of this question of architectural drawing. Once on a day men built far better than they drew. Now it is the other way. Few buildings ever look so well as the drawings promised and I would go the length of saying that what looks well on paper will certainly not do in execution. Alas that the converse of this proposition should not hold good, else the secret of how to design were easy of solution.

DISCUSSION.

Mr. Burke: I am very sorry that the time will not permit any extended remarks in connection with Prof. Nobbs' paper; Prof. Nobbs has given us, I think, one of the most interesting papers that we ever had at any convention. It has been of absorbing interest; and he has brought us face to face you might say with the best men in England in matters of drawing. We owe him a great debt for his kindness in giving us this paper. I beg to move a vote of thanks to him for his paper.

Mr. Gouinlock: I have much pleasure in seconding that vote of thanks.

Mr. Baker: I think this paper should not be passed over without some discussion even if we have to sabrifice a few minutes. Prof. Nobbs comes to us and tells us that if the drawings do not suit us and do not look nice we needn't despair because probably they are better than we think they are. One point in his paper struck me, when he referred to the beauty of the drawings and the work of the Ecole students. I do not think he made clear to the gentlemen here that these drawings are measured drawings and are really better than the work they are intended to represent. I think he should have pointed out that in drawing architects' scales cannot be too good so that the workmen in carrying out the work would be able to follow the lines laid down. I was glad to hear him speak of Mr. A. M. Prentice, a man well known to me. I had the privilege of being closely associated with him in London and I know he is an excellent draughtsman. I hope Prof. Nobbs will return to us and give us a paper later on, and that his stay in Canada will be of long duration.

The President: I know this is a mere formality, but we cannot so very well express what we all feel; the most pleasant thing to me about the lecture is the lecturer; to think we have a man like yourself upon Canadian soil. I congratulate the Quebec Association, with whom you will work most immediately and I congratulate ourselves in at least being your neighbors. It affords me much pleasure to tender you the vote of thanks of the Association (applause).

VISIT OF ARCHITECTURAL STUDENTS TO THE SCHOOL OF PRACTICAL SCIENCE.

On the afternoon of Saturday, February 13th, the Engineering Laboratory of the School of Practical Science was opened to the senior class students of the Ontario Association of Architects. Facilities were placed at their disposal for a series of tests on the strength of materials. A pleasant and profitable couple of hours was spent at the machines in the laboratory making experiments, illustrating the characteristic behaviour of material when subjected to stress. Tension tests were made on steel, compression tests on long and short parts, and transverse tests on cast iron and on long and short wooden beams. After the tests were completed a short time was spent in examining other testing machines, and a large number of specimens of material that had been tested. Thanks are due to Prof. Wright for affording the students the opportunity of visiting the school.

THE NEW PRESIDENT OF THE P.Q.A.A.

Mr. Jos. P. Ouellet, President of the Province of Quebec Association of Architects, was born at St. Fidele, Charlevoix County, Que., on the 22nd of October, 1871. He is the son of Cyrias Ouellet, now mayor of Kamouraska, Que.

The son of a contractor, from his early years he has shown a marked disposition for the art of building.

He entered Levis College in 1884, and after a brilliant course of classical studies, studied science at Laval University.

In 1889, he began to study Architecture with Messrs. Tanguay & Vallee, and in January 1893, graduated as an Architect, after having attained the mention "Summa cum laude." He worked in his patrons' office for two years, and in 1895 opened an architect's office at Quebec, where, after eight years of hard work and perseverance, he has secured a large clientele.

MR. JOS. P. OUELLET,
President of the Province of Quebec Association of Architects.

He always took an active part in the management of the P.Q.A.A. For six years past he has been Secretary of the Quebec Section, and for three years a member of the Council of the Association, the last of which, as 1st Vice-President. He is now at the head of his profession at the age of thirty two.

Mr. Jos. P. Ouellet has spent the whole of his life at the study of his profession, and as a pastime, has taken an active part in military matters in Quebec. He is one of the best qualified officers of the Canadian Militia, having a long course infantry certificate, and passed the Royal Military College staff course at Kingston. He is very popular in Quebec, as Major in the 9th regiment, "Voltigeurs de Quebec," as well as brigade Major of the Xth brigade of infantry.

Major Ouellet counts a good many friends in Toronto, where he spent three months at Stanley Barracks, attached for a course in the Royal Canadian Dragoons. It may be added that he is a bachelor in arts as well as in private life.

MASTER PAINTERS AND DECORATORS.

The convention of Master Painters and Decorators of the United States and Canada held in Toronto a fortnight ago was a most successful one. There was a large attendance, especially of delegates from the United States. A number of interesting questions and papers affecting the trade were discussed as per the programme printed in January number. The attractively arranged exhibits by manufacturers of materials, gave added interest to the meeting. The proceedings terminated with a ball at the King Edward Hotel. An outcome of this convention has been the organization of a Canadian Master Painters' Association, of which Mr. J. M. Faircloth, of Toronto is the president.

THE BALTIMORE FIRE.

Mr. Theodore Starrett, of New York, whose firm have made a specialty of building sky scrapers, as the result of an investigation on the scene of the Baltimore fire states: That steel frames stood the test well; that practically no harm was done a steel structure where it was adequately protected by bricks, cement, or "hollow blocks"; that of the building materials, stone, brick, terra cotta, and "hollow blocks", brick endured far and away the most satisfactorily; that plate glass did not impede the fire at all; melting and exposing the interior early; that every web in "hollow blocks" is an additional protection; that concrete stands the test best of all fire-proofing materials; that terra cotta is easily destroyed.

The death is announced of Mr. King McC. Arnoldi, architect, of Ottawa.

PROVINCE OF QUEBEC ASSOCIATION OF ACRHITECTS' ANNUAL CONFERENCE.

The meeting place this year was the Chateau Frontenac, Quebec, and the conference was attended by some 25 members, of whom about half journeyed down from Montreal to be present. The following persons were in attendance: W. E. Doran, J. S. Archibald, Prof. P. E. Nobbs, W. J. Carmichael, D. R. Brown, C. Bernier, R. P. Lemay, J. P. E. Dussault, C. Baillarge, Thos. Raymond, A. Levesque, A. H. Larochelle, E. B. Staveley, G. E. Tanguay, A. Chausse, J. E. Vanier, J. A. Karch, Jos. Venne, J. H. Lebron, J. P. Ouellet, J. E. Larochelle, S. Finley, Raoul Lacroix, F. X. Berlinquet.

Shortly after half past ten W. E. Doran, the president, took the chair. The minutes of the last annual meeting held at Montreal on January 27th, 1903, were read and approved and also those of the special general meeting held on November 14th of same year.

The annual report of the Council was then taken as read and adopted on the motion of Mr. Tanguay, seconded by Mr. Karch.

The Treasurer's report was similarly disposed of in the motion of Mr. Lemay, seconded by Mr. Bernier.

The election of office bearers was then proceeded with and the following is the result: President, Mr. J. P. Ouellet; 1st Vice-President, Mr. J.S. Archibald; 2nd Vice-President, Mr. A. Chausse; Secretary, Mr. J. E. Vanier; Treasurer, Mr. D. R. Brown.

Members of Council—Messrs. W. E. Doran, R. P. Lemay, J. Z. Resther, W. J. Carmichael, A. A. Cox and Jos. Venne.

The auditors appointed for the following year are Messrs. L. Lemieux and P. E. Nobbs.

Mr. Doran then congratulated the new President and after thanking the retiring Council for their support during his term of office moved the new President to the chair.

Mr. J. P. Ouellet in the chair then rose to thank the members for the honor done him and paid a graceful tribute to the energy of the retiring President and referred to the arduous legislative business of the coming session.

It was then moved by J.S. Archibald, seconded by Jos. Venne, that the following amendments be made to Section Eight of the By-laws.

(a) At the end of the fourth paragraph after the words "Matriculation fee" add "Of ten dollars."

(b) In connection with the fifth paragraph, erase that section of the paragraph after the word "Accompanied" at the end of the third line and substitute the words "By the registration fee of $25.00."

(c) In connection with the sixth paragraph, add at the end of this paragraph the words "Should the candidate fail to present himself for examination, he shall forfeit the sum of $5.00."

(d) In connection with the eighth paragraph after the word "Acoustics" at the end of this paragraph, add the words "Specification of works."

(e) In connection with paragraph nine, omit that part of the paragraph after the word "Examiners" at the beginning of the seventh line, and subatitute "In the event of the candidate not being admitted to the examination, no portion of the registration fee shall be forfeited."

(f) Insert the following between paragragh nine and ten: "The Board of Examiners shall report to the Council on the result of the examinations at the regular meetings of the Council for March and September respectively. The Council shall notify candidates of the result of the examinations within eight days following the adoption of the Exminers' report." Mr. Archibald made it clear to the meeting that there was no new principle involved but that the changes in the wording of various clauses were designed to make them more harmonious. At the same time he stated, the Council had prepared in accordance with the resolution passed at last annual meeting, a pamphlet for the guidance of candidates. These proposals were adopted.

It was next moved by Mr. W. E. Doran seconded by Mr. J. S. Archibald to add to bye-law 8th:

"Candidates for admission to registration as architects who have graduated from recognized schools or colleges of architecture after a full course of four years and who shall present certificates of having successfully passed in such schools or colleges in their final examination, for any of the subjects prescribed by this bye-law shall be exempted from further examination in such subjects."

Mr. Doran in introducing this motion pointed out that this motion proposed a slight extension of the principle of recognizing standards of examinations held by other bodies already admitted. Subjects in which the P. Q. A. A. examined and not covered by the work of graduates of Architectural Colleges would be still enforced, while the question of whether a college be recognized or not remained in the hands of the Council.

Mr. Lacroix moved that the question be referred to a Committee appointed by the Council; as it was too serious to be disposed of at a general meeting.

Then Mr. Venne objected to the principle of the motion, holding that the Association should have absolute control of its qualifying examinations. He admitted that the standard at present was low and would have to be gradually raised.

Mr. Lacroix was permitted to speak a second time. In warmly supporting Mr. Venne's attitude his main contention was that the dignity of the Association could best be assured by keeping the control of the examinations.

Mr. Nobbs then rose to speak in support of Mr. Doran's views but to second Mr. Lacroix's amendment as he deemed the matter should not be settled out of hand. In so far as this motion affected McGill he reminded the Association that it was at their instance that a School of Architecture had been started there and a great deal of money had been spent on equipment and endowment. That school had now passed through the stages that all architectural schools on this side pass through—the stages of too close connection with the engineering college that gave it birth—and he was able to announce that a purely Architectural Course and the degree of Bachelor of Architecture had been embarked upon. The proposal of Mr. Doran would be of great benefit to McGill as an inducement to students of architecture to study there and therefore for the good of the profession. The Association existed for two purposes—for the advancement of the study of architecture and for the regulation of professional conduct. Its existence as a close corporation was a mere incident of these high purposes.

Mr. Nobbs then proceeded to compare the standards of Architectural education required for the R. I. B. A. final by the American Colleges of which he had made a special study and by the Association and stated that there was no comparison possible between the Association standard and that of the Royal Institute and the American Colleges with which McGill would now be ranked. In conclusion Mr. Nobbs said he would be pleased to see the graduates of McGill Architectural school required a longer term with a principal after leaving college and before presenting themselves for admission to the P. Q. A. A., and he would gladly see a design required of them by the P. Q. A. A. but he had the greatest objection to their being compelled to take examinations in subjects already passed on a higher standard and he did not think it was to the interest of the Association that they should do so.

The meeting then adjourned for Lunch.

At 2.30 the President again took the chair when Mr. Archibald continued the discussion, with a view to ventilate opinion on the subject. He reminded the Association that they had set $600 aside to put a student through the McGill course and asked if that would have been done if as good training could be had outside its walls as inside. Moreover he knew that that University had been largely drawn upon for examiners for the Association and endorsed Mr. Nobbs remarks as to the low standard hitherto required by the Association, which must be raised. After citing cases in which members of the American Institute of Architects had been admitted to the Association and referring to the rule by which members of the R. I. B. A. and of the O. A. A. were admitted while all graduates of Universities were exempted from the Association Preliminary examination, he argued that the principle of Mr. Doran's motion had long been established of adopting equivalents to the examinations. Moreover the motion before the meeting left it entirely in the hands of the Council what colleges should be recognized.

Mr. Belinguet then spoke a few words on the practical nature of all architectural training and while agreeing with what had been said on the matter of standards and examinations felt that it was in the office alone that the architect could learn much that was vital.

The meeting then adopted the amendment referring the matter to a committee nominated by the Council and to include the proposer and seconder of the amendment and to report at the next general meeting.

Mr. Doran laid before the meeting a letter from Mr. E. Maxwell strongly objecting to the present tariff and urging a

universal 5 per cent. for first-class work, regardless of size, and 10 per cent. on fittings, etc., and reminding the Council of last year that this matter had been handed to them to deal with and that nothing had yet been done. Mr. Doran explained that the Council and members of the Association were as strongly opposed to points in the present tariff as Mr. Maxwell but that they felt some tariff legally recognized was better than none and that it was not desirable to ask for legislation every year. After an animated discussion in which Messrs. Baillarge and Vanier took part a motion was adopted, proposed by Mr. Venne seconded by Mr. Brown, "That without recognizing the assertion of Mr. Maxwell that the Council paid no attention to the question of amendments to the tariff; that the said letter be referred to the Council with instruction to study the question and to report at the next annual meeting."

Mr. Venne, seconded by Mr. Archibald, then brought in a scheme of awarding medals to various classes of work with a view to stimulating artistic effort and rewarding skill. The scheme dealt with domestic, public and ecclesiastical awards of merit, the former being that on which most stress was laid, as Mr. Venne deplored the condition of domestic work in the towns of the province generally. Mr. Berlioguet criticised the scheme and Mr. Lemay spoke in support of it, after which the question was remitted to the Council to be given effect to.

Mr. Venne, seconded by Mr. Tanguay, called the attention of the Association to the state of competition management in the Province which gave rise to many misunderstandings and proposed that the Council make a study of the customs of other countries in this connection and frame a set of by-laws calculated to prevent abuses as far as possible.

Mr. Lacroix next called the attention of the Association to the unprofessional practices which appear still to obtain in the province with regard to rate cutting and the preparation of plans free as means of canvassing for work. Mr. Berlioguet did not agree with the first speaker that it was possible to draw a hard and fast line with one's clients to whom an architect may justifiably desire to do a favor, though against competitive rate cutting he felt as strongly as any one present. Mr. Venne quoted a case in which when a building was burnt down 21 sets of drawings were supplied to the owner by members of the profession unsolicited. The sentiment of the meeting was wholly against such practices.

Mr. Chausse, seconded by Mr. Vanier, moved that a special committee be appointed by the Council to amend the charter and by-laws relative to the election of office bearers and to report at the next general meeting. This was agreed to.

Mr. Chausse moved that a year book be issued containing the charter, by-laws, calendar, tariff code, and papers read before the Association. Mr. Archibald seconded the motion provided "if means could be found" were inserted, as he said the financial state of the Association was the only drawback to such a scheme. Messrs. Brown, Baillarge and Karch supported the idea and the motion as amended was remitted to the Council to be dealt with.

Mr. Chausse, seconded by Mr. La Rochelle moved that a badge be designed and worn by members. After some discussion of a desultory nature the matter was dropped.

Mr. Karch proposed that the Council take action to urge on the Government the necessity of legislative measures for the arbitration of trade disputes. The proposal failed to find support.

Votes of thanks were then moved, seconded, and heartily accorded to last year's Council for their labors, to Mr. Larochelle and Mr. Finley for acting as scrutineers, and to the management of the hotel for the use of the Empire Room for the Exhibition.

The president then complimented the Association on the exhibition which had been got together and reviewed the work of the coming session.

Mr. Venne, seconded by Mr. Archibald, moved that the next annual general meeting be held at Montreal.

This was all the business.

P. Q. A. A. EXHIBITION.

The exhibition of architectural work displayed on the walls of the Empire Room at the Chateau Frontenac, Quebec, in connection with the P. Q. A. A. Conference, while presenting some features of interest, is on the whole disappointing when one thinks of the glorious building traditions of ancient France which in this province one might still hope to find manifesting themselves either as survivals or as revivals. Domestic work was all but absent; of public buildings there was little to be seen; city offices were fairly numerous and represented the best body of work, while though there was much church work it was not of a high order of merit. Taking the church work generally the classic examples were far ahead of the Gothic efforts. A tendency is to be noted in a good many of the church designs to lavish all the ornament and embellishment on the Western facade and to carry out the rest of the building in the baldest way.

From Mr. Vanier's office there were several drawings and photographs. The Classic Church of St. Jean Baptiste, Montreal, though open to criticism on the score above alluded to shows some sound scholarship. It is a pity that the porch had not a deeper projection and that the lantern on top of the dome is so very small; the octagonal flanking turrets at the west end are very satisfactory. There is a considerable feeling for picturesque grouping in the Hotels de Ville designed in the Francois I style from the same office.

Mr. Payette shows us a dainty set of drawings for a romantic house in brick and stone with a half timbered third storey and picturesque pavilion roofs with sweeping bell casts.

Mr. Venne presents a clever pencil drawing for a library facade in what may be called the Ecole des Beaux Arts style of French classic. The design would be the better of more weigth at the angles of the projecting centre where there is no abutment worth mentioning for the heavily rusticated arches of the window openings.

Mr. Resther exhibits a drawing for the great Pensionnat de Ste. Nom de Marie, Outremont, in a somewhat stereotyped classic style but a sound building nevertheless.

Messrs. Finley & Spence have a perspective of the Guardian Building, Montreal, a somewhat ornate city building and a very beautiful drawing illustrating a design for the City and District Savings Bank. The design for the Montreal Athletic Association Club House appears less refined than the rest of their work.

Messrs. Hutchison & Wood illustrate the London, Liverpool & Globe Building, Montreal. As a whole this building is a happy solution to the "city building" problem, but it is not improved by the very coarse decorations with which it is adorned.

Mr. Baillarge exhibits an old scheme for a Parliament House dating from about 1660. The elevation shows a great Corinthian colonnaded facade, reminiscent of the Louvre. He also shows decorative designs in which a sincere and successful effort to design ornament with some symbolical meaning is manifest.

Mr. Tanguay's project for a great Late Romanesque Cathedral church at St. Hyacynthe is striking. The fleche of a very late Gothic character is hardly in tune with the rest.

Messrs. Staveley and Staveley show a block of houses for Park Avenue which is one of the soundest pieces of design exhibited.

Dr. Doran illustrates the Catholic High School, Montreal, receotly completed, and a design for a Bank in a pure classic Ionic

Mr. Venne has some church work in which the detailing shows much thought and some bold originality.

Mr. Stone shows some severe office buildings, in which breadth is the main element of charm; and very refreshing and bold they are in these all too ornamental days.

Mr. Taylor's branch banks in a pure classic style come somewhat as a surprise to those accustomed to his work on a Byzantive basis. He also submits some charming student sketches of Italian clock towers and belfrys and photographs of the triumphal arches he designed to celebrate the visit of the Duke of York.

Mr. D. R. Brown has a perspective design of the Olivet Baptist Chapel, Montreal, a building what may be called Modern Gothic atyle in brick and stone and certainly the best example of Gothic architecture in that City, the amended design being a decided improvement on this first sketch.

Messrs. Saxe & Archibald show an elevation of the Bellview Flats, Montreal, a tall apartment building in yellow and red brick and some picturesque cottages at Westmount.

CORRECTION

The illustrations of Ospedale Maggiore, Milan, and Mosaic Pavement, Ravenna, printed in the CANADIAN ARCHITECT AND BUILDER for January, were reproduced from drawings by Mr. Cecil Burgess, but were wroogly credited to Prof. Nobbs.

We are indebted to Mr. Burgess for the following descriptions:

OSPEDALE MAGGIORE

The Ospedale Maggiore or Great Hospital of Milan is one of the most interesting architectural works in that city. It is one of the largest as well as one of the oldest institutions of the kind in the world. The principal facade of the building belongs to the middle of the 15th century at which time the hospital was founded. Of nine courtyards which the buildings enclose the largest and most splendid is the immense central one over 200 feet square, built, by Ricchini, in the early part of the 17th century. A portion of this courtyard is here illustrated. It is entirely surrounded on the ground level by an open loggia, or wide vaulted passage, presenting to the courtyard an arcade of 17 arches on each side. The first floor consists of somewhat similar loggia, portions of which, however, are enclosed by a screen wall with beautifully designed windows.

The materials are remarkable. The pillars on both stages are monoliths of grey granite, with granite bases and terra cotta capitals. The plain wall surfaces are of brick, plastered and coloured yellow. The molded and decorated work is all of pale red terra cotta which, though more than two centuries and a half old, is in perfect preservation. The modelled panels of both upper and lower friezes contain a wonderful variety of design. It is difficult to detect repetitions. The first floor windows have sparred wooden shutters. The crowning entablature which is proportioned to the total height of the facade is designed with consoles dividing the frieze into panels and giving support to the large modillions of the cornice.

This is probably the most important work of the Renaissance executed in terra cotta. Not far from Milan the cloisters of the Certosa, of Paira, give a splendid example of mediaeval terra cotta work. The earliest part of the Milan Hospital is also a fine example of terra cotta work of a curiously transitional character.

PAVEMENT AT RAVENNA

This marble pavement of Roman workmanship was found in 1875 near the Basilica of St. Appolinare in Classe, a few miles from Ravenna, and is now preserved in the Accademia delle Belle Arte in Ravenna. The vase below the peacock is a fragment of a Byzantine mosaic which has been inserted into the old Roman one.

TORONTO BUILDERS' EXCHANGE DINNER

A very successful dinner under the auspices of the Toronto Builders' Exchange took place in McConkey's restaurant, in Toronto, on the evening of the 23rd inst. An innovation was made this year by inviting ladies, the wives and friends of the members, whose presence added attractiveness and interest to the occasion.

The newly organized Brantford Exchange was represented by Mr. Whittam. It was a subject of regret that the Exchanges in London and other cities were not also represented.

Mr. R. G. Kirby, the newly elected President of the Toronto Exchange, presided, having on his right the Mayor and on his left Mr. Thos. Crowford, M.P.P. The vice-chairs were occupied by Messrs. J. R. Hoidge, Henry Martin, Geo. Duthie, Thos. Christie and James Munroe.

The excellent menu was prefaced by the following specification:

"Trust not too much in new friends and old houses"

Specifications of materials to be supplied and labor to be furnished at the Annual Banquet of the Builders' Exchange, February 23rd, 1904

GENERAL CONDITIONS

Parties estimating on this work to pay for Bill of quantities before they will be allowed to tender. Members of Board of Control, Aldermen or Civic Employees will not be allowed to compete.

TIME

Time will be the essence of this contract. The whole works must be complete in every particular and handed over to the proprietor on or before 9.30 on February 2 rd, 1904, in order to make way for decorative artists of Oratory and Music.

CONTRACT

The form of Contract will be the Revised Builders' Contract No. 2.

Section 2 of this contract provides that the contractor must give this work his personal attention and must not sub-let any part of the work.

Section 4. Should the proprietor or architect require any alterations of, or deviation from this specification they shall pay for same at time of change and avoid disputes later on.

Section 4. Should the work not proceed fast enough the contractors will not be allowed to quote the Street Railway as a precedent for further delay.

Section 5. All disputes to be settled by arbitration

Section 6. Re-insurance; the proprietor shall insure the contractor against any damage or loss of time through this contract.

CUTTING

Each department of trade to do their own cutting.

MATERIAL

To be the best of their respective kinds and any material delivered on the job to be the property of the proprietor. No material such as spoons, forks, etc., to be removed without the order of the superintendent in charge.

FOUNDATION

Great care must be taken to prevent frost interfering with this work for at least three days previous to commencement of operations.

"He that buys a house ready wrought,
Buys many a plank and nail for naught."
"What, do we meet together?
Ay, and I think one business doth command us all."

The National Anthem having been heartily sung in response to the toast to The King, the Mayor responded to the next toast "Our City," proposed by the chairman. He dealt with the importance of civic affairs affecting as they did the pocket as well as the health and happiness of every citizen. As showing the growing importance of the city, he stated that the revenue of the Toronto post office this year reached a million dollars, being 30 per cent greater than that of Montreal and that the city's proportion of street railway receipts had increased nearly three times in ten years.

"Our Country," proposed by Mr. J. R. Hoidge was replied to by Mr. Crawford, M.P.P.

In proposing "The Architectural Associations," Mr. Henry Martin urged that the relation between architects and builders should be more intimate and sympathetic than in the past. He referred also to the desirabilit of architects adopting a uniform contract. At present every architect has his own form, and in many cases the builder signs it without knowing its provisions, only to find later on that he has bound himself to do more than he had any idea of.

Mr. Sproatt, replying on behalf of the Toronto Architectural Eighteen Club, said that builders should refuse to sign a contract the terms of which were not satisfactory. They should also demand a fair price for their work in order to maintain a proper standard of workmanship. Speaking from the architects' point of view, he believed modern demestic architecture in Toronto was equal to that of any other city on the continent.

Mr. Siddall, representing the Ontario Association of Architects, in the unavoidable absence of Mr. Gemmell, the President, corroborated Mr. Sproatt's estimate of the quality of domestic architecture in Toronto. He sympathized also with Mr. Martin's plea for more friendly relations between the architects and the builders; the latter, in the present day at least, were endeavoring to do honest work, and cases of sins of willful commission were rare. He regretted the great waste occasioned by labor disputes, and hoped that the legislature, which was understood to have the subject under consideration at the present session, would be successful in devising a remedy.

Mr. George Duthie, in humorous terms, proposed "Sister Organizations." Mr. Whittam, of Brantford, on behalf of the Exchange of that city, thanked the Toronto Exchange for assistance given the younger organization which he represented, and remarked that their aim was to elevate the standard of workmanship so that their work might express to future generations the integrity and skill of the builders of to-day.

Mr. Locke responded on behalf of the Toronto Master Painters' Association, referring to the benefits accruing from the recent convention in Toronto of the Master Painters and Decorators of the United States and Canada.

Mr. Thos. Christie proposed "The Press," and Mr. James Munro "The Ladies."

In addition to Glionna's Italian Orchestra, the following well-known artists contributed to the evening's enjoyment: Miss Mildred Stewart, contralto; Mr. Owen A. Smiley, entertainer; Mr. Arthur Blight, baritone; Mr. W. F. Tasker, accompanyist.

To the following gentlemen composing the Dinner Committee the success of the occasion is largely due: Henry Martin, chairman, J. B. Thompson, R. G. Kirby, Geo. Duthie, James Crang, Walter Davidson, Alex. Marshall, Jos. Russell, J. R. Hoidge, secretary.

AN IMPROVED DIRECTORY FOR BUILDINGS.

The question of a Directory or Bulletin in front of large office buildings, is one of the utmost importance. Some of the finest buildings are spoiled by the unsightly wooden, glass and brass bulletins, which always look incomplete, as in most cases unless the building is fully occupied, there are a few spaces missing.

The signs are usually made by several painters, and brought from other buildings, and are always thrown together any old way, making anything but a neat entrance.

Most of the large buildings put up the last few years however, have had the advantage of the changeable directory, arranged alphabetically, which is put on the market by The Martel-Stewart Co., of Montreal. There are some beautiful examples of this directory in the Grand Trunk Railway, Montreal, Liverpool, London & Globe Building, Guardian Assurance Building, Canada Life Building, and in fact in the majority of the large buildings in Montreal and other Canadian cities, as well as in the United States and Europe.

The cut here shows what one would suppose would be a finished directory, and although it is, there still could be over 100 names put on without crowding same, and twenty-five names could be taken out, and still the directory would look complete.

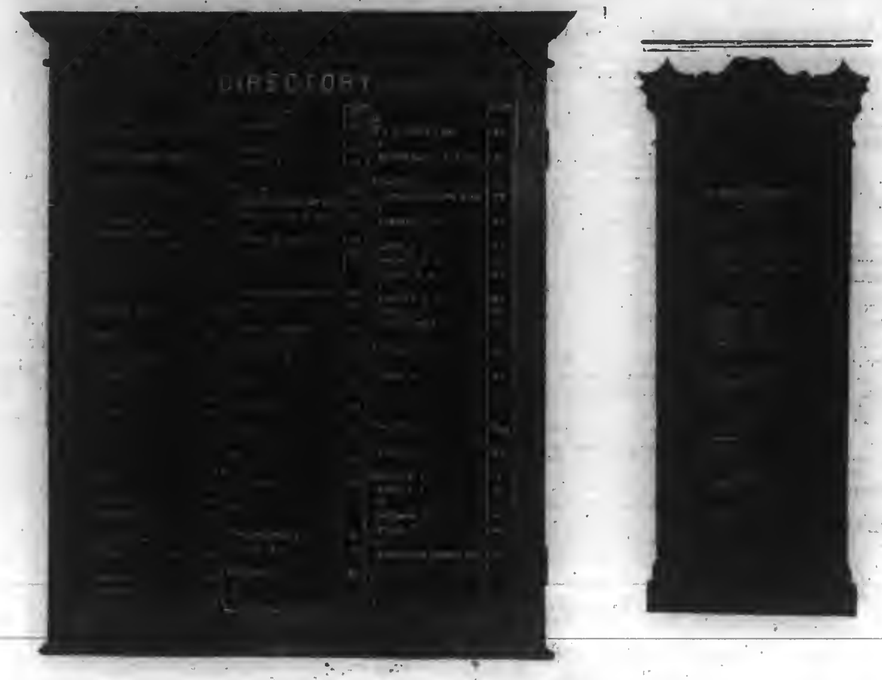
The result is obtained by the use of a grooved background covered with a dark cloth, in which white celluloid letters with a V spring on the back are placed in the proper positions, forming the names. When it is necessary to change the names, it can be

done by the janitor of the building in a few minutes. This makes the directory always appear properly, and is a great improvement on the old style office directories, which are even now being put up in some of what are otherwise modern buildings.

The following are a few examples of what are seen :

The marble slab lettered in gold with black seems to be the most popular, but after they have been lettered a couple of times by different painters, they have such a poor appearance and such a medley of different styles of type, that they are an eyesore to the entire building. The polish of the marble also wears off from constantly cleaning the paint off.

On directories lettered on glass, it is almost impossible to make a nice job, and in most cases the directories have to be removed to be altered every time a new tenant comes into the building. This is a great source



of annoyance as it deprives the other tenants of their names being on the directory while it is away.

The wooden directory with black panels and white letters, is another sample of a poor office directory, as after it has been changed a few times, one half of the directory appears to be new and the other half old.

With none of these directories is it possible to keep the alphabetical arrangement, which is almost absolutely necessary for quick finding of any names.

There is also a changeable directory, in which little paper letters are pasted on card, and inserted in a frame with glass over. These are rented by the firm who makes them, and every time a new name is wanted, it is a matter of several weeks waiting for the name from New York, and re-arrangement of the whole directory.

The plan adopted by all the large buildings seems to be almost the same plan of this cut, naming the offices in the basement of the building either, A, B, C, D, or B-1, B-2, B3, etc., and then above numbering as follows :

Ground Floor	1 to 99
First Floor	100 to 199
Second Floor	200 to 299
Third Floor	300 to 399

Or in event of there being less than ten offices on each floor, they sometimes read,

Ground Floor	1 to 9
First Floor	10 to 19

and so on up to the top.

By arranging the letters alphabetically, it is easy to find a name at a glance, and if the number of a man's room is 213, the elevator man knows at once that it is on the second floor, and really never requires much thinking on the man's part who is looking for a certain tenant, that the office was on the second floor, and that the first number denotes the floor the office is on.

The frames of these directors can be made in a great variety of styles. In the North British and Mercantile Building in Montreal, there is one of these directories with a very handsome green marble frame.

The directory in the Grand Trunk Railway offices, McGill St., Montreal, on the main floor, has a natural oak frame, hand polished, set in wrought iron easel, the whole costing upwards of $1,000.

The directories, however for an ordinary building are quite reasonable in price, costing according to their size and number of letters, etc., from $50.00 to $200.00.

These directories are not only used for office buildings, but have been used by stock exchanges for quotations, Steamship Lines for S. S. sailings, Military organizations, Hotels, Hospitals and also in Churches to denote Pew Holders. In fact the uses are unlimited.

The small cut on this page represents a brilliant idea for changeable directories, denoting the heads of the different departments in a factory, bank or office of any kind. This has an imposing effect on customers entering the office where it is placed. It is also a great time saver, as people coming in know from the Bulletin who to inquire for in the different departments.

There are a great many times in offices, where the wrong party is called from his work, and comes down a couple of flights of stairs, and finds that it is not he who is wanted, but the head of another department.

The Martel-Stewart Co., of Montreal, are the makers of this directory and will give all further information with pleasure.

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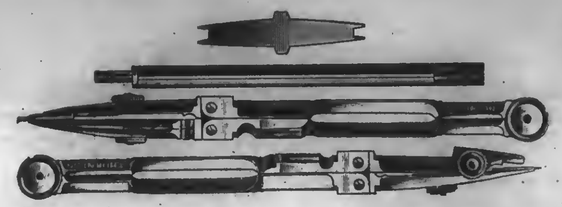

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NOTES.

A well-known Venetian engineer, Signor Vendraso, states that the tower of San Giorgio Dei Greci is in danger of falling. This fine campanile, which is nearly 200 ft. in height, is more than 400 years old. The inclination of the tower, which was observed to be about 18 in. in 1889, has been slowly increasing, until now it is more than 3 ft. out of the perpendicular. In his opinion the campanile must soon succumb unless immediate measures are taken to restore it.

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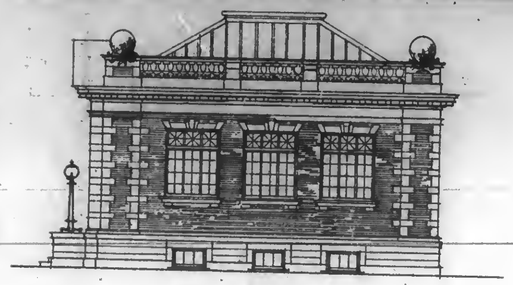
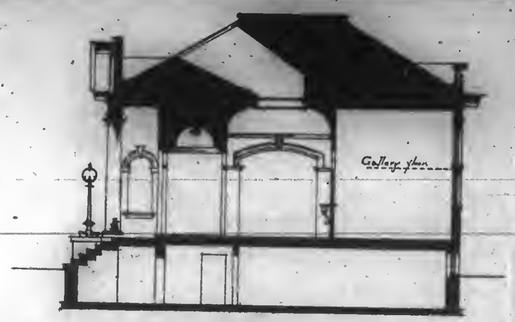
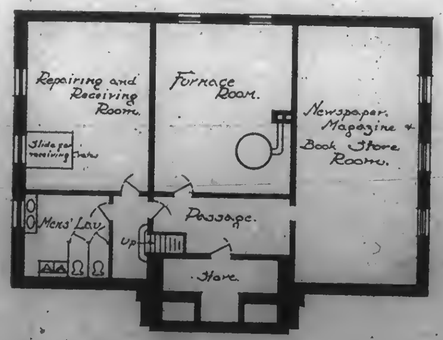


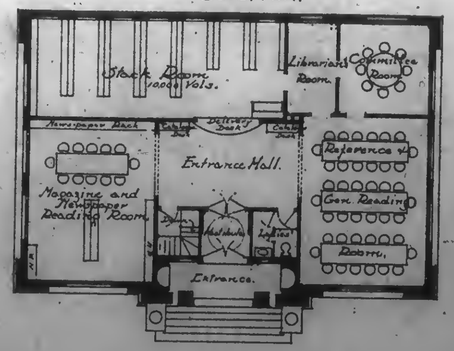
Side Elevation



Section.



Basement Plan



Ground Floor Plan

CANADIAN ARCHITECT AND BUILDER STUDENTS' COMPETITION FOR LIBRARY.
DESIGN BY "NAPSUGAR" (MR. CLARENCE THETFORD, TORONTO), AWARDED THIRD POSITION

CANADIAN ARCHITECT AND BUILDER STUDENTS' COMPETITION FOR LIBRARY
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SIDE ELEVATION

THE CANADIAN ARCHITECT COMPETITION

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SCALE ONE-EIGHTH INCH

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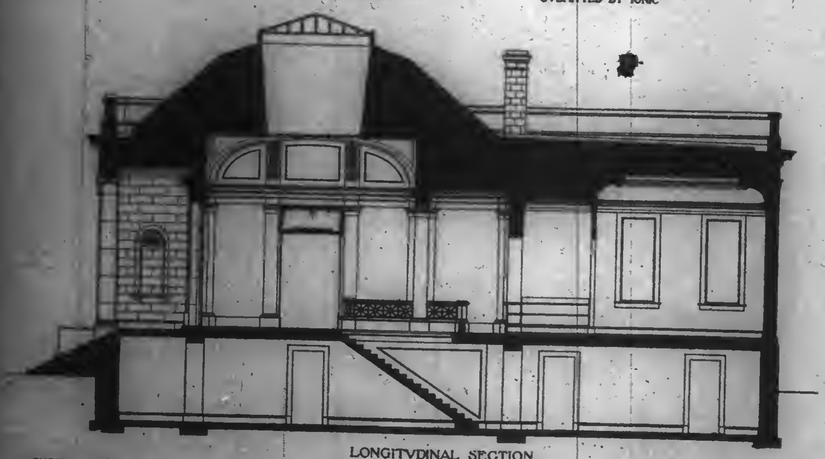
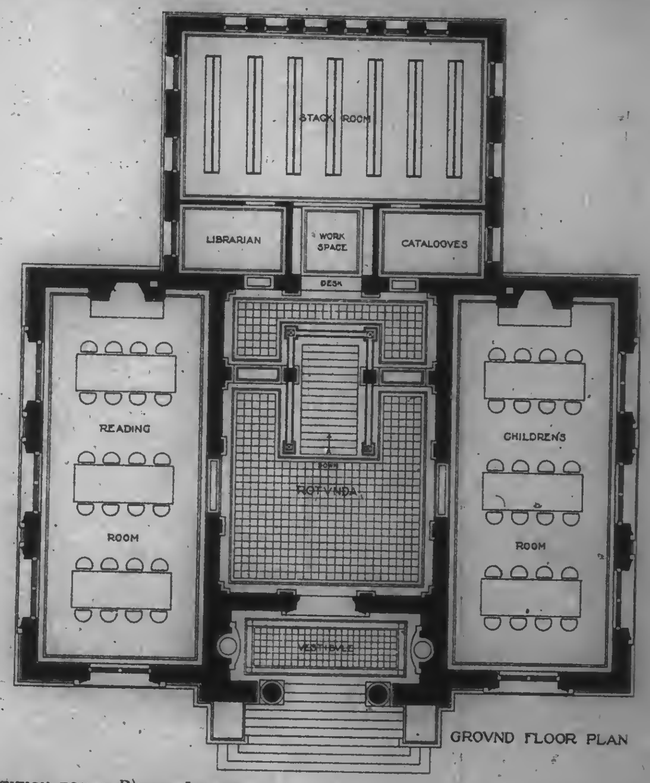


LONGITVDINAL SECTION



GROVND FLOOR PLAN

CANADIAN ARCHITECT AND BUILDER.

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CANADIAN ARCHITECT AND BUILDER STUDENTS' COMPETITION FOR A PUBLIC LIBRARY
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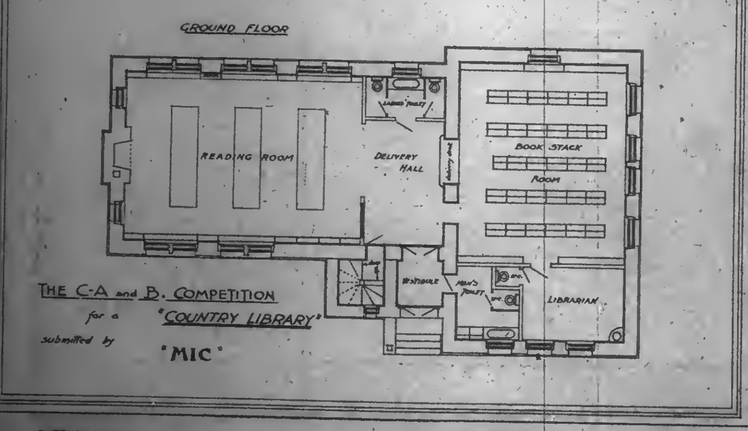

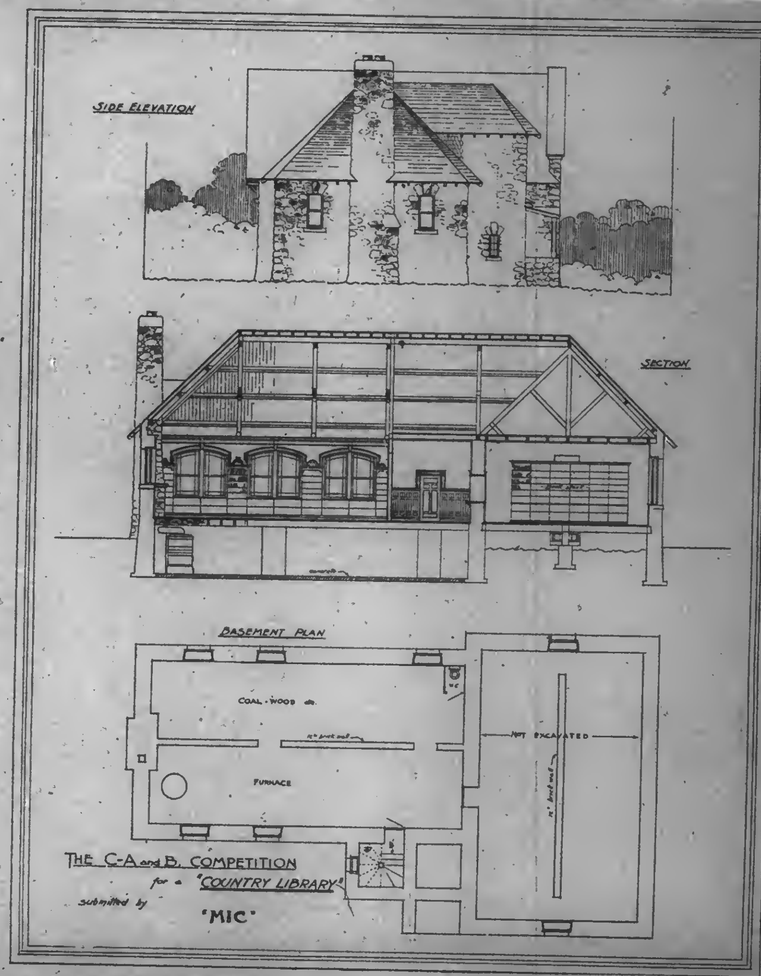

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CANADIAN ARCHITECT AND BUILDER.

COTTAGE AT WINNIPEG, MAN.
MR. GEORGE BROWNE, ARCHITECT

The Canadian Architect and Builder

Vol. XVII.—No. 195. MARCH, 1904.

ILLUSTRATIONS ON SHEETS.

Bank of Montreal, Sydney, C. B.—A. T. Taylor, F.R.I.B.A., Architect.
House in Glen Road, Toronto.—Chadwick & Beckett, Architects.
Fire Station, Quebec.—Staveley & Staveley, Architects.
Miscellaneous Sketches.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Entrance, Woburn Cottage Hospital, for the Duke of Bedford.—H. P. Adams, Architect.
"The Gothic Room."—House in South Kensington.

ILLUSTRATIONS IN TEXT.

Portrait of the President of the Toronto Builders' Exchange.
Portrait of the 1st Vice-President, London Builders' Exchange.
Group Photograph, Toronto Builders' Exchange Annual Dinner.
Fidelity & Bond Building, Baltimore.
Illustrations accompanying article on Meditations in a Church.

CONTENTS

Editorial - - - - - 49-50
Meditations in a Church - - - - - 51-52-53
A Graphical Solution of the Fink Roof Truss - - - 54
Some Comments on the Baltimore Fire - - - - - 55
The Chicago Theatre Fire - - - - - - - 56-57
Photography for Architects - - - - - - - 58
Ecclesiastical Art in Ireland - - - - - - 59
Lombardic Columns - - - - - - - - 60
Plumbing Practice Up-to-Date - - - - - 61-63-64
The Iroquois Theatre Fire - - - - - - - ix
A Visit to the Canada Foundry Company's Works - - ix
New Idea in Hot Water Distribution - - - - - ix
Personal - - - - - - - - - x
Business Notes - - - - - - - - - x
Furnishings of the British Buildings at the World's Fair - xii

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" W. H. ELLIOTT, Toronto.
" A. F. DUNLOP, R.C.A., Architect, Montreal.
" FRED. T. HODGSON, Architect, Collingwood, Ont.

Uniform Building Laws. The International Society of State and Municipal Building Commissioners was recently organized in the city of Washington. One of the purposes of the Association is to secure a greater degree of uniformity in building regulations. The object is praiseworthy, and one that we hope to see achieved. The combined experience of a large number of cities in relation to the most satisfactory methods of constructing buildings, to ensure safety and reduce the fire risk should be embodied in a standard set of regulations that should govern the construction of important city buildings in the future.

Vancouver Warned. A letter appears in the Vancouver papers over the signature of Mr. Henry Lye, a well known fire insurance adjuster, protesting against the proposed erection in the heart of the city of a wooden building of immense size, which must prove a source of danger to the more substantially built structures surrounding it. In 1886 Vancouver was laid in ruins by fire. Is a period of only seventeen years sufficient to efface the memory of such a catastrophe and destroy the lessons it should teach? While the adoption of the severest restrictions in force for the prevention of fire in metropolitan centres might be calculated to hinder the development of young cities like Vancouver, building in such cities ought nevertheless to be subject to reasonable restrictions. This especially applies to the business district, in order that none but buildings of substantial construction and appearance may be put up, and that the appearance of the principal thoroughfares may be pleasing and impressive and a barrier placed in the way of the spread of fire. A city of the size and importance of Vancouver ought to have build-restrictions of some kind, and any kind should be sufficient to prevent the erection of a fire trap in the centre of the business district.

The Water Supply of Toronto. The property owners of Toronto have shown wisdom by voting in favor of the by-law submitted for their approval on the 23rd inst. to authorize the expenditure of a million dollars for improving the public water supply. The city has entirely outgrown the present system and from the standpoint of health as well as of fire protection, demands that the capacity of both pumping and distributing systems be largely extended. During the present winter the city was brought almost face to face with a water famine, and much destruction of property must have resulted if a serious fire had occurred during the time when there was but little pressure on the mains. There are some things a city may do without, but an abundant supply of pure water is an absolute necessity

and ought to be provided regardless of cost. A great mistake was made when a year or two ago the charge to consumers for water was cut in half. In consequence of this cut the revenues of the water department have since fallen short of the expenditures by more than $75,000 per year. This deficit has to be made up by the property owners, who were therefore not as favorably disposed to vote the money now required for improvements as they would have been had the department remained on a self-sustaining basis. In view of the urgency of the case, however, it is gratifying to note that a broad view of the question was taken, and the authorities put in position to carry out the improvements.

The Building Outlook.

It is perhaps too early to speak with certainty regarding building enterprises likely to be undertaken during the season now opening. The information at hand, however, would indicate that taking into consideration all sections of the country, a fairly brisk season is in prospect. So far as can be learned it would appear that the numerous and serious labor difficulties which were a marked feature of last season and which reduced so materially the income of both contractors and workmen, are not likely to be repeated this year. Agreements have already been reached in some trades and it is to be hoped that soon after the first of April, all possible causes for disagreement will have been adjusted and removed out the way. In New York the plan has been introduced of dating wages agreements from the first of January instead of as heretofore from the first of May. A sufficient number of unions have already given their assent to the change of date to insure the success of the movement. The change is a most desirable one and must work to the advantage of all whose interests are in any way dependent on the prosperity of the building industry. The builders and building workmen of Canada should lose no time in adopting similar action, thereby getting rid of the uncertainty which in the past has usually prevailed at the opening of every building season. This uncertainty and the recollection of last year's experience may have something to do with the fact that so far contractors in Toronto have been asked to do but little tendering.

The tightness of the money market may to some extent have a retarding influence upon building this year, but speaking generally, the prospects point to a fairly active season in Toronto. In Hamilton a repition of last year's activity seems certain, the leading architects' offices being crowded with work much earlier in the year than usual. The erection of the immense new factories of the Deering and Westinghouse Companies giving employment to thousands of skilled workmen, has created a large and immediate demand for moderate cost dwellings. Throughout western Ontario much building is said to be also in prospect. In Winnipeg and the West as well as in the Maritime Provinces all indications point to a record year for builders.

In the United States lower prices are expected to prevail. Mr. J. Knox Taylor, Supervising Architect, is quoted as saying that during the past few months there has been a drop in tenders amounting to upwards of 20 per cent. and he looks for still lower figures. He further states that there is now keen competition for government work, while a year or so ago bids were comparatively few. In Canada prices for labor and materials are likely to correspond closely with those of last year. While the output of lumber will be considerably reduced, the slackening of demand from Great Britain and also from the United States, due to the disturbance to trade caused by the approaching Presidential election, will likely prove an effective offset to any advance in prices.

The Baltimore Fire.

Since the recent great fire Baltimore has been crowded with visitors, principally architects, contractors and experts. The architects have been looking for information, and many of them for commissions. The contractors are on the look-out for contracts, while the building experts, including many city architects and building inspectors, have visited the scene with the object of observing the effects of the conflagration upon the various kinds of building materials and methods of construction. One fact stands out prominently as the result of this fire, namely, that steel buildings when properly protected by fire-proof materials, such as porous cotta and reinforced concrete are able to withstand a severe fire. But for the fact that several steel structures stood in the way and blocked the progress of the fire, the public buildings and a large section of the residential district of Baltimore would have been destroyed. This fire has further emphasized the necessity of protecting by means of iron shutters, wired glass, or other equally effective methods, the windows of large buildings in the business centres of cities.

The Mayor of Baltimore has appointed a committee of citizens to advise concerning the reconstruction and improvement of the burned district. The existing building by-laws of the city will be carefully revised and remodelled before any new buildings are allowed to be erected. It is proposed that all new buildings over 100 feet in height shall be fire-proof throughout; that stores and warehouses more than two storeys high be equipped with fire-proof shutters on all windows not opening on a principal thoroughfare; that all outside walls shall be build of stone, brick, iron, or other non-combustible material, and that the roof sheathing shall not extend across front, rear, side, end or division walls. It is proposed to establish a municipal experimental testing department for the investigation of materials by the department and by builders and contractors.

BANK OF MONTREAL, SYDNEY, C.B.

The position of this building, illustrated in the present number, is in the centre portion of the town. It is built of freestone from the "Wallace" quarry in New Brunswick. The interior is cruciform, with piers carrying arches supporting the central dome, and is very spacious, lofty and light. The finishings and fittings are in oak, with old brass railings. The floors are marble mosaic in ornamental patterns. The general contractor was Mr. Reid, of Windsor, N.S., and the contractors for fittings were The Rhodes Curry Co., of Amherst, N.S., who all did their work very well. Mr. Andrew T. Taylor, F.R.I.B.A., of Montreal, was the architect, and Mr. Hopson, of Sydney, superintended the construction.

MEDITATIONS IN A CHURCH

A good old church always sets the eye to work measuring possibilities of application to modern conditions. The church I have been seeing for the last month is not at first sight at all suggestive of conditions in Canada. It is in the middle of a little nest of halls, two half timbered and one of Queen Anne brick; which all, beautiful in the first place, are made doubly so by being reflected in a series of fish ponds round which they are grouped. These buildings were the successive residences of the head of the family which built the church. They did not do it all at once, as is evident not only from the appearance of the stone but from the structure of the church. The portion marked off by corner buttresses was built first; it most likely had a small chancel proceeding from the east side, of less width than the body, but it had neither the present chancel nor the present tower which are both built of a redder stone than that of the body and are obviously additions to it. This evidence of piecemeal work may be encouraging for church builders who build for posterity; but, in addition to the fact that we are posterity and build for ourselves, it is not so very encouraging in view of the fact that, as completed, the ratio of seating accommodation to cost is such that it would cost a congregation somewhere between 800 and 1000 dollars a head to reproduce it in Canada. Nevertheless there is no repressing the suggestiveness of the plan—a single rectangle. It is both more spacious, more handsome, and more economical than any other form, when it is properly treated and of an area within reasonable limits, and both scale and treatment are so right at Gawsworth that, after admiring it on many occasions, I have thought it desirable to get it down on paper and here is the result:

The old body 40'.0" x 29'.0" continues to be the body of the church. The chancel, though of the same width, and nearly as long, 33'.8", was built only for honour and glory, partly of God and partly of the family of the Fyttons. Here, nearer heaven by one step than the common people, they used to sit, and here are their tombs, with an inscription on one which proclaims them "Fit on's to wear a heavenly diadem." The Fytton sare gone now. The last trace of them disappeared in marriage with Lord Mohun and it was for her inheritance, this very Gawsworth, that Lord Mohun fought with Duke Hamilton, as recorded by Thackeray in Esmond. Their tombs and their sixteen quarterings in painted marble remain, and make one wish that this kind of feature (fig. 2) could be repeated in Canada. Nothing seems to sanctify a church so much as these relics of vanity; at least when there are recumbent figures upon them, (good recumbent figures,) to make one feel the presence of the dead among the living. And when, as in this case, the monuments remain in all their dignity while the family is gone forever, it becomes a case of sermons in stones, of building better than the builders knew; for the monuments which were ordained to perpetuate family honour point also to its evanescence. There is evidently something to be said for monuments, but most, I think, for life sized figures; recumbent figures, I should say; in marble; in painted marble.

The great thing, however, is to get the church built.

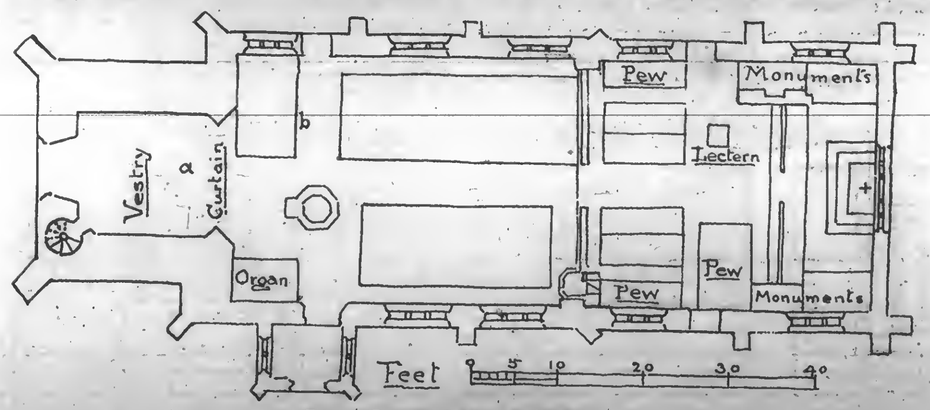

FIG. 1.—PLAN OF GAWSWORTH CHURCH.

FIG. 2.—MONUMENTS TO FYTTONS.

The plan in fig. 3 is a study of its possibility. As far as the general proportion goes, an internal view of the existing church is most satisfactory from the extreme west, i.e., standing at the entrance under the tower, where, through a high arched entrance to the tower, the whole length of the roof is to be seen. A suggestion of the view is given in fig. 4 from a photo taken from the point marked A, under the tower. The camera is not as inclusive as the eye and it was not possible to get in either the same extent of roof that is seen by the eye or, what is the great beauty of the view, the windows along the sides. The photograph was taken to serve as a sort of sectional view, showing the relation between the span and the height of the wall. This is exactly satisfactory in proportion to the length from west to east, and these dimensions—92'.0" length, 29'.0" width, and 23'.0" wall height—would make a well proportioned single chamber church as laid down in fig. 3—which is like some aisled churches with the aisles omitted.

The side passages 2'2." and the centre 5'.0" are quite enough; the seats seem to want a few inches in length to make them take six persons of moderate size with ease. An exact width would be 30'.3" and the other dimensions may be safely increased in proportion.

For hearing, the total length is not too great for the familiar words spoken from the altar, where the speaker has also the advantage of having a wall close behind him. The greatest distance for ease in speaking from the pulpit would be, as far as one can judge by the eye in the church, the distance from the east wall to b. on the passage from the north side door. This distance may then be transferred to the new plan as the distance of the chancel screen from the west end. The length thus left for the chancel is about right and the width, allowing for return passages for communicants, is no more than is necessary for good arrangement on the pulpit side, for the reading desk should range with the men rather than with the boys. The lectern may repeat the pulpit on the other side and there will thus be a mask to both hind seats and a similar motive in plan at the ends of the screen.

The three seat arrangement of the choir requires some defence as it may lead to mixing up men and boys if the balance is to be kept. But, in the first

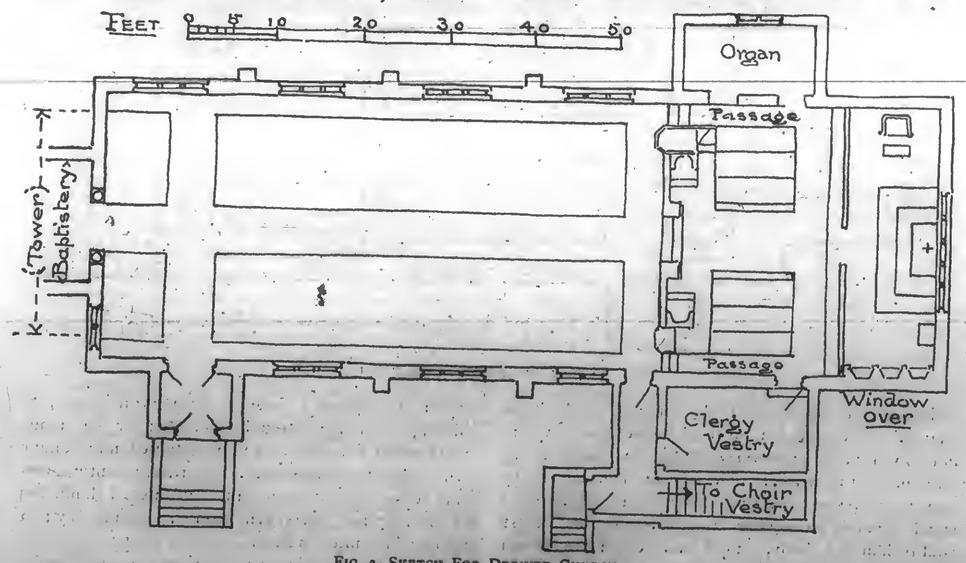

FIG. 3. SKETCH FOR DERIVED CHURCH.

place, alto boys are usually too tall for the boys' row and had better sit with the men; and secondly, the back seats are not likely to be filled except on festivals. The two front seats on each side, which would mean 10 men and 14 boys, would be enough for ordinary use.

The three seat arrangement is otherwise an advantage in reducing the depth of the chancel. It will permit the allowance of due spaciousness at the east end.

There ought to be no suspicion of narrowness in front of the communion rail or within it, and abundant room must be left for this.

The depth thus given to the choir is one bay of the roof; and the walls of the organ chamber and vestry take the place of buttresses. To make the vestry gable not wider than a bay, the church can be entered under a long slope masked by a gabled porch.

Here then is a church seating 250 and, if one can rust study from a model different enough to make some guessing necessary, both convenient and economical; that is to say, as far as the latter point is concerned, the walling is simple and dignity may depend merely on roof and windows. Apart from proportion in the latter, which costs nothing, deep reveals seem necessary; and these are the natural result of the hollow walls which are the churchwarden's friend and the coal dealer's enemy. As for the roof, it is not impossible to give a roof architectural character without great cost, but we are not so confident as formerly that this can be done merely by displaying its architectural essence. The real truth is that an acceptable open timber roof is acceptable only from its superfluity. The

FIG. 4.—VIEW LOOKING EAST.

gothic revivalists who displayed scientific trussing have left roofs that are anything but acceptable. The safest bottom idea to have is continuity of surface. Vaulted roofs and such perpendicular roofs as that of Grawsworth are one in this respect, and indeed an open roof with trusses four times as many as is necessary or four times as heavy as is necessary is not far removed from the same feeling. If pitched rather than flat, crossed by heavy construction members and recessed or double recessed, its continuity is still the leading idea if the nature of the transverse supports is not entirely revealed and the attention directed to them. I would then try this as a way—a way for which wood and plaster would suffice—to accomplish for this church a roof that would be both dignified and economical.

W. A. LANGTON.

A GRAPHICAL SOLUTION OF THE FINK ROOF TRUSS.

By Prof. C. H. Wright, of the School of Practical Science, Toronto.

Let the annexed daigram Fig 1, represent a Fink roof truss supporting the loads AB, BC, CD, DE, etc., and let the reaction of the left wall be MA. Consider first the forces acting on the point ABLM. There are two

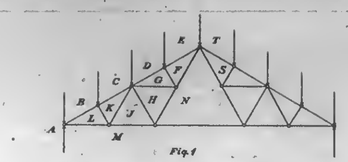

Fig. 1

known forces MA and AB and two unknown, BL and ML, exerted by the members BL & ML on the point as in Fig. 2.

From any point M, Fig. 3, draw the lines MA and AB to represent the wall reaction MA and the load AB.

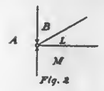

Fig. 2

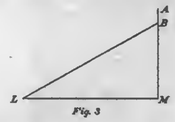

Fig. 3

Fig. 4

Through B and M draw the lines BL and ML parallel to the directions of the forces BL and ML.

Let these lines intersect in L. Then MABLM is the vector diagram for the point, and the lengths of BL and LM represent the magnitudes of the forces BL and LM acting on the point—the force BL being a push and LM a pull, hence the member BL is in compression and LM in tension.

Proceeding to the point BCKL the known forces acting are LB and BC, and the unknown CK and KL as in Fig. 4.

From any point L Fig. 5, draw the line LB parallel to the force LB and from it cut off the length LB to re-

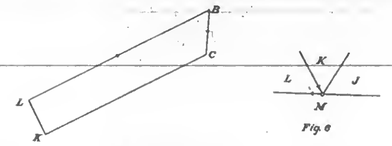

Fig. 5 Fig. 6

present the magnitude of the force and from B draw BC to represent the force BC.

Through C draw CK parallel to the force CK and through L draw LK parallel to the force LK intersecting CK in the point K.

Then LBCKL is the vector diagram for the point and CKand KL represent the forces CK and KL. These are both pushes on the point, and therefore the members CK and KL are both in compression.

Considering the forces acting on the point JKLM there are two known forces ML and LK and two unknown KJ and JM as in Fig. 6.

The vector diagram being MLKJM fig. 7, where KJ and JM represent the forces KJ and JM. As they are both pulls on the point the members KJ-JM are in tension.

Now examine the conditions existing at the point DEFG. There is one known force DE and three unknown, viz.— EF, FG and GD as indicated in fig. 8.

Two of these forces DG and EF act in the same direction and will have a resultant acting in this same direction. For these two forces substitute their

Fig. 7

Fig. 8

Fig. 9

resultant and the forces acting on the point are DE, GF and the resultant of DG and EF or R, fig. 9.

Draw the vector diagram (fig. 10) for these three forces and the lines DE, GF and R will represent the force DE, GF and R, and as GF is a push on the point the member GF is in compression.

At the point FGHN there are four forces acting, one of

Fig. 11

Fig. 10

Fig. 12

Fig. 13

which FG is known and the other FN, HN and HG are unknown and act as in fig. 11.

Of the unknown forces FN and NH act in the same direction and will have a resultant acting in that direction. Substituting this resultant for the two forces

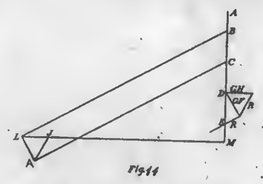

Fig. 14

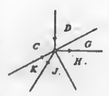

Fig. 15

and the set of forces becomes GF, GH and R2 (Resultant of FN and NH) fig. 12.

Draw the vector diagram GF, and GH and R2, fig. 13,

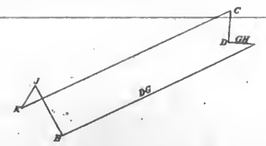

Fig. 16

and the length of the line GH gives the magnitude of the tension in the member GH.

Combine these four vector diagrams in one (fig 14

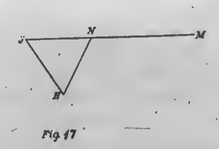

Fig. 17

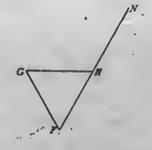

Fig. 18

The annexed diagram Fig. 15 represents the condition existing at the point CDGHJK. There are two unknown forces DG and HJ. Draw the vector diagram

J, K, C, D, GH, DG, H, J, fig. 16, and the length of DG and HJ will give the magnitude of the unknown forces.

The vector diagrams for the points MJHN, NHGFV,

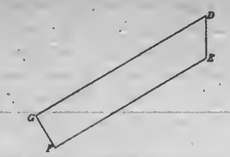

Fig. 19

and DEFG are given in figs. 17, 18 and 19 respectively.

Adding these four vector diagrams completes the combined diagram as in fig. 20.

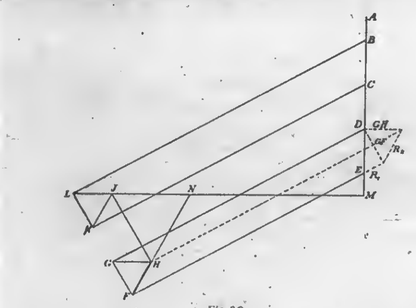

Fig. 20

Suppose the loads AB, BC, CD, DE and ET are unequal, that their total is equal to the load on the

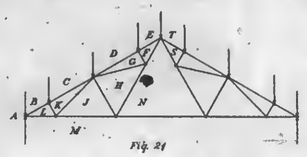

Fig. 21

right hand principal and that the lengths of the members BL, CK, DG, and EF are unequal as in fig. 21.

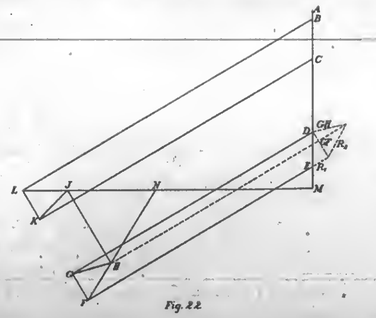

Fig. 22

Proceed as in the above problem and construct the vector diagram fig. 22.

The work of excavating the Roman remains at Silchester, in Hampshire, (England), has been productive of valuable results. A number of tesselated floors have been unearthed, while a magnificent section of mosaic pavement, with a figure representing a dolphin, in a remarkable state of preservation, and over 1,000 pots and vessels, of varying sizes and shapes, have been brought to light.

SOME COMMENTS ON THE BALTIMORE FIRE.

By a Visitor to the Scene.

Huge heaps of debris, entire streets of them, and amidst this desolate vista of broken brick or stone an occasional steel-frame structure, standing sentinel-like, over the scene of the disaster. Such is the scene left by Baltimore's recent fire and giving to Engineer and Architect the injunction. "look here upon this picture and on this." The brick rubbish is all that remains of the acres of non-fireproof buildings.

One good service was done by the wholesale conflagration in supplying owners and designers with the strongest sort of proof that modern fire-resisting practice was based on true theory. The fire-proofed building, about which many professed scepticism, has fully vindicated itself.

The Fidelity & Bond Building, Baltimore.

The intensity of the heat at Baltimore is indicated by the thoroughness with which everything combustible was licked up—hardwood flooring, door and window trim, and interior fittings. While this was the case, the efforts to protect the structural steel framing are seen to have been mainly successful, and most of the steel work is as good as ever and the walls only need superficial repairs.

The buildings with concrete fire-proofing, without exception, have passed through the fiery ordeal showing a wondertul state of preservation, under the most severe conditions.

A striking case is that of the Commercial & Farmers' National Bank, where the upper floors of the building were of mill construction and the floor over the bank was the only one fireproofed. It was a concrete floor and all the debris of falling walls, safes, etc., landed on it, but according to "Iron Age" it was absolute-

ly uninjured, while all above, including the roof, was completely ruined. Another building, the National Bank of Commerce, had all the wood-work burned out of it, but the concrete floors are absolutely intact. The writer saw a large safe being moved across the concrete floor. The banking house of Alex. Brown & Sons is another example, with floors and roof included, of expanded metal and concrete fireproofing. The military cordon and debris strewn street alone prevented this institution from opening for business the morning after the fire.

A most remarkable example of the fireproofing qualities of concrete is exhibited in a four storey structure now known as the "Concrete Building", the concrete is intact and as good as when first installed. The buildings on all sides of it were levelled to the ground and the brick walls of the building itself crumbled and fell away. The cast iron front failed also, and to-day this concrete monument stands, a paradox of a building largely consisting of floors without walls.

The concrete work at Baltimore displays an unbroken record of complete immunity from damage by the general conflagration, and without exception will not cost a dollar for repairs.

THE CHICAGO THEATRE FIRE.

On this subject Mr. Chas. Baillairge, Architect, of Quebec, writes:—"I see by the report of the Commis-

Annual Banquet of the Toronto Builders' Exchange, February 23rd, 1904.

which prior to the fire was the office of the U.S. Fidelity & Bond Co. We publish a view of this building showing its unique appearance. It is built of steel-reinforced concrete floors, roof, beams, and columns. In erecting the building, party walls belonging to adjoining buildings were used instead of building new walls, and in order to carry the floors pilasters of concrete re-inforced with steel rods were built up against the walls, and on these were carried the beams, also of concrete and steel rods. The beams are about 22 feet long, spaced about 10 feet apart. The floor slab is of reinforced cinder concrete, about 5" thick. There is no structural steel in the building, so that there can be no warping of heavy metal framework. Although the brick walls and iron front succumbed, as well as everything combustible,

sioners appointed to inquire into the cause of the disaster, that is, as to the rapidity with which the fire from the stage reached the auditorium and was the cause of the loss of so many lives in the short space of a few minutes, that while in the roof or ceiling of the auditorium there was an open ventilator, a skylight which on the roof over the stage end of the building should have been open, was on the contrary hermetically closed.

"Now, say the Commissioners, all the smoke and heated gases, which, had this skylight been open, would have passed out direct through opening, had to seek issue by the ventilator over the auditorium, thus creating a current of air which prevented the lowering of the incombustible curtain which, with the wall separating the auditorium from the stage, was intended to

cut off all communication between the two in case of fire.

This current of smoke and heated gases, which, had the stage ventilator been open, would have passed out directly through that issue, being prevented from so doing, rushed through the proscenium arch or opening with such rapidity and force that it pressed the curtain so tightly against the groove or sides in which the curtain was intended to work, that it could not be got down lower than within 14 ft. of the stage floor.

Thus the fumes and gases asphyxiated the audience and in a very few minutes; those in the galleries or upper tiers being, of course, the first victims of the disaster.

The Commissioners insist forcibly and are right in doing so, that the stage sky-light or ventilator should have been open during the performance, and that had it been opened and the gases enabled to escape in that direction, there would have been no such a current of air towards the auditorium as to prevent the lowering of the fire-proof curtain, and probably no loss of life at all on the auditorium side of the cut-fire wall between the auditorium and the stage end portions of the building, would have occurred.

This should be noted and immediately acted on by the managers of our Quebec so called Auditorium, though it is only the audience side of the structure that can be properly so called.

A ventilator over the stage can easily be made of proper dimensions and at trifling expense, which while allowing the fumes and heated gases to pass out, would exclude rain and snow, etc.

True, there are the so called emergency doors—five of

Mr. R. G. Kirby,
President Toronto Builders' Exchange.

them on the eastern and four on the western side of the building, with iron staircases leading from them to ground level; but in such a climate as this, the landings of these outer stair-ways might, in the case of a heavy fall of snow, become impeded during a single sitting or representation and the outward opening of the emergency doors be thus prevented.

There should be a lad at each door with strict orders not to leave his post during the performance; for at the Paris Charity Bazaar fire, there were seven emergency doors, but no one having been stationed at them to open them, when the explosion of the acetylene apparatus of the cinematograph occurred, the audience from the far ends of the bazaar building (300 ft. in length) had to travel 150 ft. to reach the central door by which they had entered, not being aware of the existence of the emergency doors.

Had these doors been opened in time all would have escaped, with scorched heads and shoulders, no doubt from the falling draperies but with their lives at any rate, and three months would have repaired all such sores and singings as were caused by the burning hangings falling from above.

Mr. Geo. C. Young,
1st Vice-President London Builders' Exchange.

The only really safe theatre of more than one story in height, as at the Somuer Park, Montreal, which is open all around and allows of immediate escape on all sides, may be said to be at Antwerp, Bruxelle, erected according to the system proposed by the undersigned in 1884 and exhibited in Paris in 1900. In this theatre there are five tiers of inside galleries one over the other, with corresponding iron balconies surrounding the auditorium end of the building on the outside. To each tier of superposed boxes or galleries there are 25 doors—125 in all—opening onto the outer balconies, with iron staircases descending from the one to the other to ground level. But even with all these precautions, the stage ventilator recommended by the Chicago Commissioners and the keeping of it open during each performance, would be none too much of a safe-guard against the possibility of the stage fireproof curtain being out of order.

When the undersigned built the Quebec Academy of Music in 1854, he had designed to have an iron cut-fire curtain (asbestos being then unknown) and the iron covered on the auditorium side with mirror in vertical strips of some 3 ft. in width, with silver-edged bars between them to keep the glass in position; but funds were lacking to carry out the scheme, and though the mirror was imported for the purpose, the rigid iron curtain was never made.

Chas. Baillairge, Architect.

Quebec, March 18, 1904.

PUBLICATIONS.

One of the latest additions to the rapidly growing literature on the use of cement for constructional purposes is a book of 200 pages, entitled "The Architects' and Engineers' Hand Book of Re-Inforced Concrete Constructions," by L. J. Mensch, C.E., published by Wm. Seavert, Chicago, price $2.00. It treats of the use of concrete for a great variety of purposes, giving results of tests and illustrations showing important works which have been carried out in this material.

PHOTOGRAPHY FOR ARCHITECTS.*

By Francis R. Taylor.

Photography should not be considered as antagonistic to sketching. It has a utility in the education of the architect by producing an accurate delineation of old buildings unattainable by a sketch. It must not be forgotten that however valuable a sketch or measured drawing may be to the individual student who prepared it, there is the personal error to bear in mind when this method of delineation is applied for general study.

Photographs in conjunction with measured drawings undoubtedly form the best means for architectural study and research. It may be mentioned that in the Architectural Association Sketch-Book there are examples of measured drawings together with a photograph of the work. This method of illustration might be employed with advantage to a much larger extent. Whenever any old building of interest is to be pulled down to make way for modern improvements, or for other reasons, a set of measured drawings with a series of photographs form the best record of the old work.

Another use of photography as a means of illustration occurs in classes of instruction for architects when lantern slides are available ; these enable all present to see, whereas diagrams and plates on the walls are only visible from certain parts of the room.

Lantern slides for architectural lectures should be made with a view to suitability of purpose. Photographs of buildings, both externally and internally, would be useful to illustrate the grouping and general effect, and then should follow photographs of towers and spires, of piers and arches, of caps and bases, of doors and windows, of vaulting, etc., to illustrate the treatment of the parts, and, lastly, of mouldings and ornament.

In illustrating constructive subjects the same principles should be adhered to—explanatory lantern slides to illustrate the manufacture and uses of the various materials, and then slides showing the different methods of construction.

The use of telephotography in the study of architecture is one which should receive careful consideration. In many instances parts of a building well worth studying are inaccessible for measuring ; in these cases an ordinary photograph gives a general idea of the composition and a telephotograph the details.

REPRODUCTION OF DRAWINGS.

The utility of photography in the practice of architecture might receive far more attention than it does. In many instances the only use to which photography is put in architectural practice is in the reproduction of drawings by the ferro-gallic process. In this process the reproduced drawings are either on a thin paper or a paper similar to Whatman's, and a black or brown line is obtained on a white ground. The advantage of the process is that the reproduced copies can be colored similarly to an original drawing. A great saving of time is effected, because from one complete set of tracings any number of reproductions can be obtained. If the reproductions are to be kept for a considerable time as in the case of copies for the authorities, care must be taken in the selection of the paper owing to its tendency to fall to pieces after a time. For this reason the authorities will only accept photographic reproductions on linen. The makers of the paper might consider the best means of surmounting this difficulty. It may be mentioned here that some of the papers shrink slightly in the process of obtaining the reproduction ; this emphasizes the necessity for fully dimensioning all drawings.

The ferro-prussiate process with a white line on a blue ground is sometimes used, but as colouring is then out of the question it is not so suitable for general architectural work. Its use is limited to drawings where colouring is not essential, as, for instance, in details of steel construction.

Besides this special application, the use of photography in architectural practice is generally limited to what may be termed the legal phase of our profession, although a wider application would be a distinct gain. No one will deny that photographs of buildings about to be pulled down are valuable records, and in ancient light, easement, party structure and such like cases would always be useful on one side or the other.

If the building happens to be one of considerable architectural interest, then the value of the record cannot be overrated.

Photographs of a building at its various stages of erection, with the dates and in some instances the time noted thereon, would be a valuable record of this class of work, and, in addition, would be very serviceable in the valuation of certificates. Engineers often adopt this method, with the best results, and there is no reason why architects should not do so.

Photographs of the finished building should in all cases be obtained, and a comparison made by showing the photograph side by side with the perspective drawing. Photographs should be taken by oneself.

It is impossible for a professional photographer to know exactly what is wanted unless he happens to have made a thorough study of architecture, and we know that in the majority of cases he has simply a mere smattering of the requirements.

It might, of course, be urged that the professional photographer could do the work under our guidance, but it will be found that this method is expensive, and is, in reality, only applicable in those instances where selection of subject is not required to any great extent.

The architect who decides to use photography as an aid in his study and practice should understand certain of the technicalities. The questions which present themselves are :—What is the best camera for architectural work? What lenses should be used? What photographic plates and papers should be employed?

Before anything can be done, the size of the camera must be decided upon. The ordinary sizes are: 4¼in. by 3¼in. (quarter-plate); 6½in. by 4¾in. (half-plate); 8½ in. by 6½ in., (whole plate); 10 in. by 8in.; and 12 in. by 10 in.

It is generally agreed that the larger sizes are the best for architectural work. But the larger the size the more expensive it will be. Besides this, the weight of the camera is a serious matter, especially as in the majority of cases the work would be done at a distance from home. For these reasons it may be conceded that the half-plate is the most serviceable. When lantern-slide work is contemplated, the quarter-plate is generally selected, as that is the most suitable size for the purpose.

If a good lens is employed, the quarter-plate size might be used for all work, as the photographs can be enlarged satisfactorily.

A camera for architectural work should have considerable rise and fall at the front, a good swing-back, long extension for long-focus and telephoto lenses, parallel or only slightly conical bellows (which prevent the cutting-off of the edges of the photograph when a short-focus lens is used), and at least three or, better, six double dark slides.

As to lenses, it is best to have a set of different foci and of a good make. They should be of rectilinear type.

For average work the rapid rectilinear of about 7in. focus is most serviceable on a half-plate. Long-focus lenses are useful in detail work, and wide-angle lenses are essential in confined positions.

The telephoto lens is a most valuable acquisition in the equipment. Some of the best examples of detail work are at too great a distance from the position available to give a photograph of a satisfactory size, but a telephoto lens enables one to obtain it to a larger scale with the same extension of camera. As this lens is not of a fixed focal length, the scale of the photograph can be altered at will, which is often useful.

Ordinary plates of a good make are the best for architectural work, especially for interiors, although in dark interiors where very long exposures are requisite rapid plates may be used with advantage. Isochromatic plates are useful when the lighting of the interior is yellow. In interiors where the light from windows, etc., would be likely to cause halation it is necessary to use backed plates.

The development of the negative requires care on the part of the operator, but this question cannot be discussed now. It may be mentioned, however, that the architect-photographer should do his own development.

The chief printing processes are silver printing-out, platinotype, carbon and bromide ; the decision as to which should be used depends upon circumstances.

A silver printing-out process, such as the well-known P.O.P. of various makes, produces excellent results, but if permanent photographs are required, platinotype or carbon processes should be used. For enlargements, bromide papers are most satisfactory.

DISCUSSION.

Mr. Arnold Mitchell said a level should always be used on a camera. Mr. George Scamell advised the placing of a scale on the building, so that it might be reproduced in the photograph ; he recommended a paper scale published by the Society of Antiquaries, price 6d. He always used a whole-plate camera himself. A pendulum level should be fixed on the back to enable the vertical lines to be accurately obtained. A camera for architecural work should have its lens fixed at the top of the front, not in the centre, as in nine cases out of ten this would avoid the front being raised. An ordinary stigmatic lens of three foci saved carrying several lenses. He had largely used Wellington Ward's stipping films, which saved much in weight and had practically no halation. "Ortol" was as good a developer as "pyro" and it did not stain the fingers. Starch paste should only be used for mounting. He thought it better to over-expose rather than under-expose. Mr. Hugh Stannus described a mirror reflector he had made for photographing ceilings, etc. ; this consisted of a piece of mechanically-planed glass carefully silvered, and was placed at an angle of 45 degrees with the camera.

*Summary of paper presented before the Architectural Association in London.

ECCLESIASTICAL ART IN IRELAND.

It is plainly evident from the address he recently delivered at a meeting of the Maynooth College Union that the Rev. J. O'Donovan, of Loughrea, not only holds strong and sound views on ecclesiastical art, but he knows how to express himself strongly. The talk of a revivial of industries in Ireland led him to urge a revivial of Irish art in church decoration. He "went for" modern stained glass, sculpture, and painting as seen in the Church of Ireland. Stained glass, he remarked, is one of the most familiar forms of decoration in our churches. There is scarcely a church in Ireland that has not one or more stained glass windows. In some of the large churches the cost of those windows runs up £3,000 or £4,000. It may seem a rather sweeping statement to make, but it is a statement upheld by every expert authority on art, that generally—indeed, in almost all cases—this glass is, from an art standpoint, beneath contempt. It is as a rule gaudy in colour, badly drawn, vulgar in design, and where perspective is attempted, false in perspective. It is, moreover, bad glass. There are many varieties of glass known by the very indefinite name of stained glass. There is pot-metal, which alone was used in the best period of stained glass. In this glass the colour runs through and through the texture of the glass, the colour and the glass being fused together in the pot. Then there is enamelled glass, in which the colour is enamelled on the glass in soft pigment. When stained glass manufacturers advertise they always profess to supply a window, as the advertisement puts it, "best pot metal antique." When the window is put up it is not unfrequently very poor enamelled stuff.

There is, he went on, a craze for pictured windows, large and elaborate subjects that tell stories. This is a complete misunderstanding of the limitations of stained glass. In the thirteenth century, when the finest glass was produced, there were no elaborate pictures ; the effects were produced by careful leading and a most delicate choice of differently coloured glass. If figures were necessary they were outlined in leads, the feature and other details being worked in with the smallest possible use of brown pigment. The artist craftsmen of these times knew exactly what could be done in glass and what could not. They knew that the first quality of a window is to give light, and next if it is to be coloured its function is to give coloured light of the finest kind. For that reason the thirteenth-century artists always aimed at colour and translucency. Now the modern windows sin in almost every instance against this primary law. The function of the modern window seems to be to shut out light, or where it is let in to pass it through thick dirty brown or other paint with which the glass is thickly plastered. Take some good glass of the best period and compare it with the modern. The best examples are to be seen at Chartres Cathedral outside Paris. There are also a few fine examples which somehow escaped the vandalism of Puritanism in some of the English cathedrals—in York Minister, in the east window, in Salisbury, Lincoln, Westminster, and others. These windows, when the sunlight passes through them, are like mosaics of different coloured jewels, they never look gaudy because of the extreme purity of their tones. Sunlight through a modern window is robbed of all its beauty,

and strikes the eye as a dirty drab. Apart from quality and colour, the modern stained glass window is bad and vulgar in design. The human figures are certainly not of any race that inhabits this earth in any know period of history. But even given correct drawing, the effects of light and shade are always wrong; they are impossible with light always falling on the picture from behind.

Another important branch of church decoration, continued the reverend critic, is sculpture. To judge by the Irish churches it is a lost art. Here again the foreigner holds the field. Go into our churches and you will find that the more pretentious of the statues come from Italy and Munich. If you venture to say you don't like the work the good priest looks you all over with a smile of superior pity, and reduces you to your proper level by the clinching remark, "Why, this statue was made at Carrara." Of course there are marble quarries at Carrara and stone-cutters of very great technical skill, but art, with an idea behind it, especially on religious art—no! Take a statue of St. Joseph, admitting that it is modelled correctly, which it very often is not, does it convey any religious idea to the mind? Only for the label it might just as well have stood for Marcus Aurelius or any other character that you like to think of. Church painting is at just as low an ebb. All our church-painting, with such few exceptions as are hardly worth noticing, comes from abroad. Rome, Germany, Belgium, France, are the principal markets. We may dismiss this branch of church art in a few words. The paintings are either attempts at religious art not above the level of daubs, or fairly good pictures—not religion. For some time past the country has been flooded by good and bad copies, generally made in Germany, of paintings entitled Madonnas, Magdalens, &c. The originals were painted by men who had no religious belief and are frankly naturalistic in treatment. Yet those pictures, often the grossest portrayal of human passion, are hung up in convents and other religious buildings, even in churches, to inspire the reverence and devotion of the faithful. There are other branches of church decoration—brass, gold and silver work and woodwork generally made in Birmingham or in Belgium.

We have first an immense consumption of decorative work that shows no sign of decreasing. We have most of this produced aboard, and done almost as badly—considered artistically—as one could possibly conceive. This work, if it could be done in Ireland, would be an immense industrial gain, and would provide work for thousands of hands. But it has behind it far higher possibilities. It may make Ireland a great centre of art production. Ireland once was remarkable for its art products. "The barbarians by the Western Sea" knew the exquisite art of enamelling on various metal when it was unknown to the Greeks and Romans. The country that produced the Tara brooch and the cross of Cong and the Ardagh chalice had surely a highly-developed art sense. In architecture our fathers did work of wonderful beauty. The Romanesque ornament at Cong, at Dysart O'Dea, the whole design of that imperishable memorial to Irish genius on the Rock of Cashel—Cormac's chapel—indicate what Irish art might have come to had it not been arrested by foreign influence. The revival, if there is to be a revival, will rest with the Church, which has at all times been the centre of art production.

LOMBARDIC COLUMNS.

Among the characteristic peculiarities of the Lombardic style, the following may be enumerated as the most obvious and the most general: Columns with cylindrical shafts, and varying greatly in their proportions, some being of the average height of the Roman Orders, others extremely short, either in proportion to their diameter or their capitals, or else exceedingly tall, and when attached to walls elongated into a mere rod, or vertical convex moulding, surmounted by a capital. Instances of fancifully shaped or decorated shafts are by no means unfrequent, some being zigzaged horizontally, or polygonal in plan, or embossed with sculpture, or either twisted or cut into spiral grooves or mouldings. Equal diversity—not to call it extravagance—prevails in the capitals, which, as far as general mass and outline go, bear some analogy to the Corinthian. If, however, some capitals are much decorated, others are nearly plain, and these are frequently in the form of an inverted cone, but in such manner as to present four flat sides or faces which again are occasionally more or less ornamented. In bases there is much less variety, they being for the most part only a series of mouldings in rude imitation of the common attic base. But one very great singularity in this style connected with columns is that of placing them upon the backs of couchant animals or other figures, which serve as pedestals to them. Whimsical as it appears to us, it may very probably have originated, not altogether in caprice, but have been occasioned by employing materials and fragments taken from ruined edifices, where columns, being found too short for their intended situation, were raised or stilted up by being set on other fragments for which purpose remains of sculpture may have been adopted, either because they chanced to be at hand or because considered more ornamental and as adding richness to the column itself. Upon the same supposition we may easily account for the great variety of columns and capitals in the same building, namely, that they were ornaments collected at random from the remains of other structures, and that the irregularities thus occasioned in the first instance grew by degrees to be a matter of taste, and was adopted as a matter of choice. Columns of the kind just specified were, however, by no means very usual, and are chiefly to be met with in those forming porches or decorating the chief entrance to a church, as in that of St. Ciriaco at Ancona, and in San Zeno at Verona. Although not invariably so, columns are to be understood as accompaniments to arches which spring from them, and arches applied in different ways are very predominant features of the style. Besides giving the form to doorways and windows, they were employed for decorating the faces of walls in very nearly the same manner as in the kindred Norman style.—The Architect.

Mr. Hebert, the well-known French Canadian sculptor, has been commissioned to prepare a statue to the late Joseph Howe to be erected in Parliament House Square, Halifax, on the 100th anniversary of Howe's birth in December next.

The members of the O. A. A. and others who had the pleasure of meeting Professor Nobbs of McGill University, on the occasion of the recent O. A. A. Convention in Toronto, will regret to learn that, immediately following his return to Montreal, he was compelled to enter the hospital and undergo an operation. It is gratifying to learn, however, that he is now on the way to convalescence.

Of the half million dollars expended in sculptural decoration for the St. Louis Exposition, women have secured a considerable part. Six are included in the distinguished corollary of artists selected to embellish the buildings. In the Art Palace the work of feminine painters compares favorably with that of men. In rug weaving, working in metal, book binding and decorative work, woman has made great progress.

PLUMBING PRACTICE UP-TO-DATE.*

By Lewis Le Grow, Toronto.

The plumber has always stood for one who works in lead; the name stands for the same to-day, but it has advanced to a position where it not only represents one who works in lead but also one who is responsible for the health of the community more than any other, and as it has been stated that there is nothing new under the sun, plumbing as we find it to-day is a contradiction of that statement.

It is not long since that plumbing was looked upon as the least important part of a house. It was considered quite up-to-date to have a 4-inch tile drain, extending from sewer on street to the most convenient point and then to run branches to different houses without respect to what basements it went through, or how complicated it might be constructed. Once an obstruction occurred in the main drain all properties dependent on it suffered in consequence. To-day every house must have its own drain carried outside of foundation walls.

Light soil pipe was universally used to bath room, then extended with galvanized iron through roof with slip joints. Every fixture in the bath room would be connected into heel or closet bend and it often connected to soil pipe with a putty or rust joint. Then for the finishing of the job, Pan, Hopper or Demerest closet was considered quite a luxury, but on no condition was any part of it to be exposed that might allow the free circulation of pure air, which in the opinion of many was not so important as that everything boxed in and painted so that microbes and other parasites might be the better increase.

With the advance of practical and technical education, laws have been adopted to compel people to appreciate good plumbing. Our improvements have affected all fixtures and condition of work, the most important being our system of backventing and syphon jet closet.

We will briefly notice the most important article of plumbing construction, namely, traps. A great many have been placed on the market, but from experience I find that traps with internal partitions are most dangerous. A flaw may exist in this partition above the water line and allow gas to enter the house. When we consider that it is not the depth of seal that offers the most resistence to syphonage, but the amount of water and that it is the depth of seal and not the amount of water that offers the greatest resistance to sewer gas, it is very important that the trap should be well made and work on the centrifugal principle with a back vent to relieve the trap from the pressure of sewer gas. The main trap in the sewer in my opinion should not be tolerated; it prevents the ventilating of sewer through the main stack and it also acts as an impediment to the flow of sewerage.

House drains should carry waste out of the house—not much nor little, but all—and do it promptly; when that which is intended for the street sewer is started on its journey it should be afforded a means of reaching its destination at once and without interruption, not a particle of filth should be allowed to cling to the sides of waste pipes nor be held in solution in some trap until it begins to decompose and give off its dangerous gases.

Kitchens of hotels and restaurants should have a grease trap situated in an open place and easy to clean out; all back vents on bath traps should rise perpendicular through the floor and not be bent so low on the trap as would allow any particles of waste matter to accumulate around its opening and stop the free ingress of air. When this occurs there is danger of syphoning. Where vents from traps connect with wrought iron pipes square elbows should not be used, angle fittings are the only perfect connection. Water closets such as the Richelieu and improved Sanitary should not be used on sanitary work owing to the vent being made a part of the trap and crockery is not a safe thing to connect with lead; the vent being rigid, any settling of the floor or movement of the fixtures is likely to break off the vent horn. And to prevent any settlement of soil pipe, it should rest on a foundation of brick or stone properly built by a mason. There are too many stacks of soil pipe connected with the tile drain allowed to rest on a bed of sand supported only with iron hangers. We have all had experiences of a very unpleasant nature from hoar frost accumulating at top of 4-inch soil pipe above roof, stopping the ventilation of fixtures and causing syphonage, allowing sewer gas to saturate the room in a short time. All soil pipe passing through the roof should be increased to 5-inch from underside of same.

Another point of very great importance to the health of the people is the proper construction of a cess pool. It should be so placed that the liquid from it into the surrounding soil may not affect the water supply or leak into the cellar of the house.

(Continued on page 55.)

*Paper read before the Toronto Master Plumbers' Association.

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NOTES.

The specification of the new naval barracks at Chatham, Eng. stated that the floors were to be caulked, and the contractor, entered into a sub-contract for the work. The space between the boarding was said in the contract to be ⅛ inch. Owing to the shrinkage of the timber this space was increased, and the sub-contractors claimed to have expended 137l. on the additional glue and oakum that was required. The defendants admitted the shrinkage, but maintained that it occurred after the caulking. The jury gave a verdict in favor of plaintiffs, with 118l. damages.

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A great source of trouble in our homes which we fail to be conscious of is the refrigerator. Into it is placed the important things of life and it is surprising how little attention is paid to the proper disposal of the waste water. It should be conducted into an open pan or sink, placed some distance from the end of the waste pipe, with a good air space. This fixture properly trapped and ventilated and supplied with faucet would remove a great source of unpleasantness.

House drainage at the present time consists of two parts, soil and waste pipe above ground and tile drains under ground.

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For each part there are different tradesmen, the plumber taking care of work above ground, the drainmen that below ground. The connection of soil pipe with the system of drainage belongs to the plumber, and he is responsible for the same. This connection has to be made with cement, and the most important of all, for it is covered up and not likely to be seen again until trouble occurs in the drainage. If then it is admitted that iron pipe free from all defects is necessary above ground, is it not of more importance that the same soil pipe should continue uninterrupted to a point outside of the foundation walls.

In this city materials out of which house drains have been constructed have remained the same while other improvements were being made, and it is time that we should take the initiative and have our drainage system placed in a proper position and constructed of material that the first cost will be the only one, and that the interest of men engaged in the manufacture of pipe must take second place to the health of the people. The ordinary tile drains must be discarded since they cannot be secured against breaking and defective joints. Perfect joints and not mere increasers must be used between sections of drains and soil pipes inside of any building. The removal of main traps and the purification of sewer gas that is the most poisonous, namely, sulphurated hydrogen and sulphide of ammonium.

It is not extravagant to talk about a perfect system of drainage since lasting material can be used. There is no more reason why there should be perishable material used and defective joints made in house drains than in the pipes which convey the gas. The latter are air tight and gas tight; so should the former be. House drains should be recognized as a part of a house, not as something that will be covered up and not of so much importance. The supervision and the construction of house drainage should be put under the direction of the responsible and practical plumber, and not as at present, any man who can do it the cheapest.

It appears very simple to those who take no further thought of it that the essential element in plumbing is the ventilation of the sewers, but conditions and details of actions require to be studied, taking into consideration the disregard many people have for the plumbing fraternity, and it will be necessary for us to use scientific knowledge and practical experience to improve the sanitary comforts for all conditions. A united co-operation between the medical, architectural and engineering societies, lead on by our own professional plumbing and heating engineers, might bring the day when we will fully realize that an Omnipotent Providence has placed on us a responsibility of educating the indifferent to an understanding that the highest material things in life are cleanly surroundings and a pure system of ventilation.

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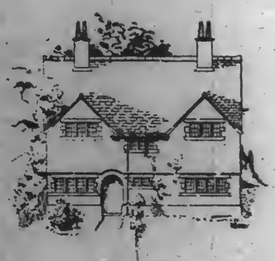
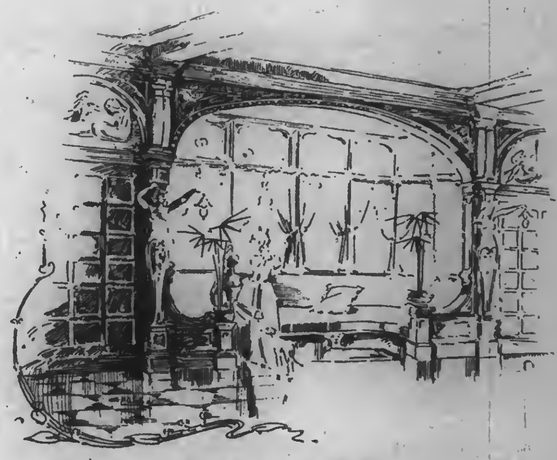


Elevation for a Villa, Ft. Frontage, to be Built in Stone and Concrete or Brick.

At Kentwell, Eng.



French Bay Window Interior.

A Farm House, Starton, Eng.

Miscellaneous Sketches.

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HOUSE IN GLEN ROAD, TORONTO.
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ENTRANCE TO WOBURN COTTAGE HOSPITAL, FOR THE DUKE OF BEDFORD.
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"The Gothic Room."—House in South Kensington, Eng.

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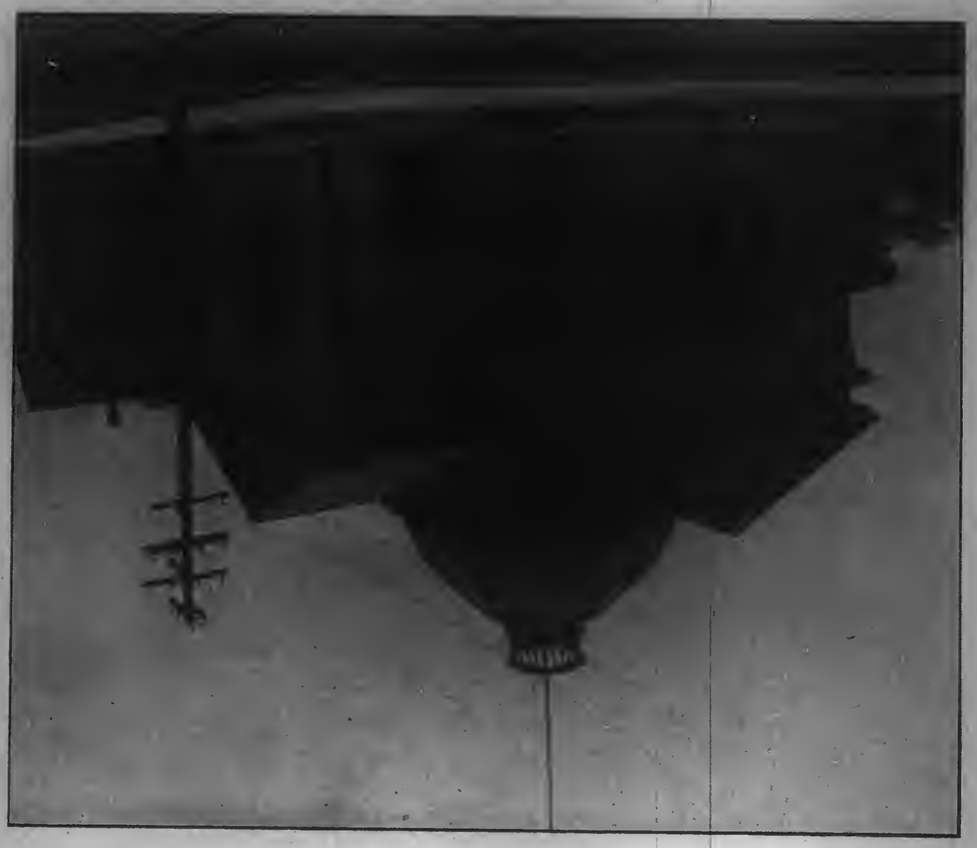

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The Canadian Architect and Builder

VOL. XVII.—No. 196. APRIL, 1904.

ILLUSTRATIONS ON SHEETS.

House in Delaware Avenue, Toronto.—R. J. Edwards, Architect.
House in Chestnut Park, Toronto.—Langley & Langley, Architects.
Stable.—Beaumont Jarvis, Architect.
Banking Room, Bank of British North America, Toronto.—Burke & Horwood, Architects.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Portion of Main Facade, Palazzo di Brera, Milan.—Measured and Drawn by Mr. Cecil Burgess.

ILLUSTRATIONS IN TEXT.

Views of Toronto Fire.

CONTENTS

Editorial	65	Province of Quebec Association of Architect	74-75-76
The Toronto Fire	66	By the Way	77
Lessons from the South Kensington Museum	67-68	A New Flooring Material	79
The Fink Roof Truss by Graphical Statics	69	Mechanics' Lien Law	80
The Architect Before the Law	70-71-72	Personal	80
Montreal Correspondence	73	Arbitration of Trade Disputes	ix

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Another Combine.

The manufacturers of builders' hardware in the United States are reported to have come to an understanding whereby all the designs have been classified and priced. It is said that the better goods are to be advanced from 25 to 50 per cent. at once, and that a 10 per cent. advance on all goods is slated for the near future.

Students' Competition.

A considerable number of architects and architectural students visited and inspected the exhibition at our Montreal office of drawings submitted in our recent students' competition. Drawings submitted in future competitions will in like manner be exhibited in Montreal, in the hope that they may awaken interest and a spirit of emulation among students of architecture in that city.

The Law Affecting Architects and Contractors.

Architects and contractors, especially those who now or in the future may have to do with the erection of buildings in the Province of Quebec, may with profit read the series of lectures by Mr. J. S. Archibald delivered before the P.Q.A.A., publication of which is commenced in the present number. These lectures deal in a very clear and concise manner with the legal responsibilities of architects and contractors under the Civil Code of the Province of Quebec.

The Study of Building Sites.

We were much struck with the remark of a young architect while showing the plans which he was preparing for some new houses, that he had not visited the site and did not know its exact location on the street. We wondered how far these houses when built would prove satisfactory to the owner and future occupants. Architects young and old should bear in mind that a careful study of the site is the first requisite to the production of a successful building, and is therefore a duty which they owe to themselves as well as to their clients.

Cement Construction.

Several articles are in course of preparation for our May number treating of the physical properties of cement, methods of cement testing and using cement in construction. Particular reference will be made to methods of reinforcing concrete with steel. In view of the truly wonderful progress which is taking place in the use of cement for construction purposes and the certainty that the material will come into more general use in the future, a consideration of the subject at some length in these columns seems advisable and likely to be of interest and value to our readers.

Safety From Frost.

The experience of last winter should lead to the adoption by Toronto architects, engineers and contractors of a new formula to govern the depth to which foundations should be carried in order to escape frost. The practice until this year was to regard 3 feet 6 inches as the utmost limit of depth necessary to ensure safety. This theory has been dispelled by the extreme frost of last winter, which in some instances caused pipes to freeze at a depth of five feet below the street surface. In Montreal,

where the winters are usually much more severe than in Toronto, the rule is to place all water and other pipes at least seven feet below ground.

The Collapse of a New York Steel Building

On March 2nd the Darlington hotel building, an eleven storey steel frame structure in course of erection at 59 West 46th street, New York, suddenly collapsed and twenty-one persons were killed. There was an outer casing of brickwork covering the steel framework. The floors were supported by cast-iron columns seated on separate off-set brick piers with concrete footings and granite caps and placed 13 feet apart. These columns carried I-beam girders and floor beams about 12 and 8 inches depth, the average spacing of the floor beams being 4 feet. Beam, column and girder connections and splices were, according to the specifications, to be bolted, no rivets being used. There were no knee or other braces. The building was designed to carry a floor load of 130 lbs. per square foot. Beams and girders were proportioned for working loads of one-quarter of this load and columns for one-fifth. The architects who prepared the plans and specifications were not employed to superintend the construction, but this duty was largely entrusted to one of their draftsmen who left their employ for the purpose. The original plans were submitted to the Building Department and approved. Atterwards these plans were changed aud a new set of plans submitted which were rejected; then a third set was prepared which were also rejected. The contractors then proceeded with the erection of the building in violation of a notice from the Building Department that operations must cease until the building laws were complied with. Objection was made by the Department to the improper method of bolting beam, girder and column connections, and to the relative rate of construction of walls and steel work. The Building Department found itself powerless, however, to enforce the building regulations, and the contractors taking advantage of this fact, proceeded with the construction of the building.

When the collapse came a number of arrests were made and an investigation was instituted by a Coroner's Jury to ascertain the cause. The jury reported finding the owner and steel work contractors "grossly criminally negligent in the methods adopted and followed by them in the erection of the building". The jury further made the following recommmendation: We recommend that the practice of the erection of buildings without the superintendence of the original architect or a competent builder of at least five years' experience be prohibited by law. We further recommend that the Building Department of the City of New York have a corps of competent engineers to inspect the erection of all buildings requiring engineering skill, and that a copy of the approved plans of each building be kept on the premises during construction." The building regulations at present in use in New York were formulated only three or four years ago by a Commission appointed for the purpose, and were thought to be very carefully and skilfully prepared to cover all possible contingencies. The occurrence to which we have referred, however, shows them to be faulty in at least one most important particular, and should lead the authorities of New York and other cities to carefully revise and make as effective as possible their regulations governing the construction of important buildings.

THE TORONTO FIRE.

Two things have specially impressed us in connection with the disastrous fire in Toronto—one that the insurance companies required only two days to decide to advance insurance rates from 50 to 75 per cent.; the other, that the City Council of Toronto have had under consideration for two or three years the framing of an up-to-date building by-law, and no decision has yet been reached. This is a fair example of the relative speed with which private corporations work in com-

CORNER OF BAY AND WELLINGTON STREETS, NEAR WHICH THE FIRE ORIGINATED.

parison with public bodies. Perhaps the thing that most requires prompt action at the present time is the adoption and putting into force of proper building regulations. There is now an opportunity such as will probably never occur again of improving the character of buildings for business purposes. The opportunity should not be lost. It would be unreasonable to compel firms who have been burned out to defer the rebuilding of their warehouses, therefore the Mayor should insist upon immediate action being taken in the direction of

WAREHOUSES ON SOUTH SIDE OF WELLINGTON STREET, WEST OF BAY STREET.

the consideration and adoption of regulations which will insure that none but substantial buildings will be erected in the place of those destroyed.

This fire, as well as those in Baltimore, Rochester, and elsewhere has clearly demonstrated the fact that no better check can be put in the way of a conflagration such as Toronto has experienced than solid brick walls. Unfortunately, many of the warehouses which stood in the path of this fire were so flimsily constructed that the walls were not strong enough to stand alone, and when attacked by the fire toppled over leaving a clear path for the extension of the conflagration.

The insurance companies should change their methods of assessing buildings, and offer greater inducements than heretofore to the owners of substantially constructed buildings. In the past buildings have been simply grouped into classes, each class being rated the same regardless of differences in construction. This method should no longer prevail, but substantial inducement should be given those who will put up solidly built structures and employ fire-proofing methods. When it is considered what great losses have been incurred by the occupants of buildings destroyed in the recent fire because of interruption to their business, it will be seen that, apart altogether from the question of insurance rates, it would pay the owners and occupants of such buildings to use a higher standard of construction.

VIEW ON WELLINGTON STREET.

At least one important building was saved by the fact that the windows on one side were protected by iron shutters. The advantage of protecting windows by this or other methods equally effective is beyond question. The value of open spaces in preventing the progress of fire has also been demonstrated. Had it not been for the open spaces immediately to the west of the Custom House and east of the Queen's Hotel, and the fact that facing on these open spaces were walls of solid brick, the fire would doubtless have spread further in both directions. While the water pressure was very defective, yet in the face of the unfavorable weather conditions prevailing this fact had little bearing on the situation. No matter what the pressure might have been, the fire could not have been stopped by the fire brigade after it had once got headway. In this connection it seems pertinent to enquire if, by the exercise of better judgment on the part of the heads of the Fire Department, the fire might not have been confined to the building in which it originated. It is said to have stated at the rear of the building, and that, instead of attacking it there, the firemen broke open the front doors, thus allowing the flames to be driven by the fierce wind through the building and across the street, setting fire to the large warehouses opposite. It would seem to be the duty of the Chief of the fire Department to direct his men on the street instead of as on this occasion entering burning buildings, where he was partially disabled, thus throwing upon the shoulders of subordinates the direction of affairs.

"Here all is sunny, and when the truant gull
Skims the green level of the lawn, his wing
Dispetals roses; here the house is framed
Of kneaded brick and plumed mountain pine,
Such clay as artists fashion, and such wood
As the tree-climbing urchin breaks.
My house, I say."

—LOUIS STEVENSON.

LESSONS FROM THE SOUTH KENSINGTON MUSEUM.

One of the best things in London is the South Kensington Museum. It shows examples of nearly every kind of design and is invaluable to designers of all kinds. Books and photographs are very well—there are books and photographs in the Museum Library—but when it comes to really feeling at home with design, to know what it is really like and measure one's mind against it with certainty, there is nothing like an example. For purposes of study it need not be the original; a model is as good. A model may fail to convey exactly the sentiment attaching to its original, or the beauty it has acquired from a bath in the atmosphere of centuries; but these are accidents which the designer's own work cannot share, and it is just as well that their attractions should not disturb his judgment as to what is essential. All that is necessary is that the actual modelling of the object should be presented to the eye; if coloured like the original when it was new, so much the better.

As a matter of fact it is a great question whether the most important part of the work of the South Kensington Museum is not done by models of its own originals, rather than by the originals themselves. Part of its work is to send out examples to Provincial Museums and Art Schools, and though it sometimes sends originals, the greater part of these little circulating exhibitions consists of models in plaster, made by workmen, attached to the Museum, who have attained to so much skill, in colouring as well as in casting, that the copies are, for practical purposes, facsimiles. They demonstrate incidentally the possibility of improving architectural casts by the application of colour; which would, in many cases, add to their instructiveness by expressing the design more prefectly. In the case of the casts which constitute the circulating exhibitions, colour is essential as part of the design of the original or to represent its material. The works exemplified are, for the most part, textiles, book binding and leather work, wood carving, silver and other surface metal work, medals, plaster work, gesso, and other decorative handiwork. The examples already prepared are in constant circulation, and a demand in any direction is met by fresh preparations. Classes of work which are not easily reproduced by casting or electro typing, or are not sufficiently portable, are represented by photographs or coloured drawings; and there is a catalogue, 138 pages long, of books for circulation in the same manner. In addition to these the Museum has a collection of classified lantern slides on all subjects, from the composition of monumental buildings down to lace work, with catalogue numbers running to 3,000, which is available for lectures and instruction in any part of the country. The card catalogue of this collection is worth noting. Each card has, underneath the title of its subject, a print of the negative from which the slide was made, and, an application for slides for a lecture on a given subject is responded to by a set of the cards which catalogue the

illustrations of that subject; so that the lecturer can make his choice with certainty.

The special interest of these proceedings to us is that they are conducted away from London, at any distance in Great Britain or Ireland from which an application is made; and one of the directors of the Museum has expressed the opinion, not official but personal, that it is conceivable that the distance to which the material of the circulating department is sent, might be extended to the colonies. The Museum authorities seem to be always on the look out for fields for further expansion of the Museum's usefulness, and an enquiry from any bona fide Museum or School of Art in Canada would be heard with attention at any rate and might be productive.

The weak point in the situation is the absence of depositories on the other side; and, in view of the excess of advantage over cost, one wonders at it. Toronto ought to have a museum of architecture and decorative art. It is a mistake to try to go on without one; and to have one is not such a great affair after all in the way of cost. It is not necessary to have originals to do good work; and it is not necessary to have everything that can be got together. Many of the old world museums are fuller than would be necessary for us, or indeed desirable. For them there is a mixed motive. There are more critics of the past among their frequenters than creators of the future, and for historical purposes a collection cannot be too complete. But what we, in Canada, want to study is not history in design but design in history. We need only a skeleton collection, the elemental types and nothing else; but we need these if we are not to flounder about, arriving at last, if we arrive anywhere at all, only at a point from which we should have started.

A well selected collection, arranged according to subject only, ignoring history as a theme by itself, would not be too extensive either to be purchased or housed. The greater part of such a collection has already been cast, and there is nothing to prevent special castings being made to complete a sequence or scheme.

Casts of the various objects of manufacture would be for the most part inexpensive. It is architecture that costs sums to cast which require consideration; yet architecture is, if anything, more in need of models than the manufacturing arts, for its originals, while the buildings exist, cannot be transported. The cost of an architectural room may be fairly gathered from an examination of the rooms at the South Kensington Museum; for the cost of each piece that has been bought is, as a rule, printed in a corner of the label which gives the name and date of the object from which the cast was taken. The examples below are given, not as subjects particularly suitable for a Toronto gallery, but as types of size in relation to cost. Size at the South Kensington Museum runs large. They have, in casts, the whole three portals of the 13th Century Gothic Cathedral of Santiago de Compostella, in Spain, measuring 57 feet in width, covered with sculptured figures in all possible and impossible places, and costing £2,300. They have the whole of Trajan's column (the top half standing on the ground beside the bottom half); the whole doorway of San Petronio at Bologna, 51 ft. by 40 ft.; the whole of the mantel from the Palais de Justice at Bruges, including 6 or 8 feet projection of the ceiling above it. In originals, they have a Flemish rood screen 42 ft. by 30 ft. costing £900; and the timbered front of the Sir Paul Pindar house as it stood on Bishopsgate Street, except the gable. But not to consider objects of this magnitude for the beginning of a collection, here are some examples, selected as being familiar either as individuals or as types:

1. Niccolo Pisano's pulpit in the Duomo of Pisa; panels crowded with figures half detached; 8 columns resting on beasts and groups of figures; a sufficient height of the column, against which the pulpit is set, included, and the steps which go round the column. Over all about 14 ft. x 18 ft. x 13 ft. high. Cost £320.

2. Tomb of Carlo Marsuppini in Santa Croce, Florence. Elaborate 15th century work. Carved podium; niche with columns, entablature and circular pediment; 12 ft. wide by 20 ft. high over all; pair of figures at base; pair of figures on cornice; bas relief in tympanum; elaborate sarcophagus in niche, with recumbent figure on top. £210.

3. Donatello's Singing Gallery for the cathedral at Florence. Double planes, columns in front of figures; about 18 ft. by 14 ft. and 4 ft. projection. £152.

4. 13th Century Doorway from Norwich Cathedral. Jambs recessed four times with columns in front of mouldings. Enthroned figure with angels on soffit of the arch. Over all 11 ft. by 15 ft. high. £120.

5. Choir screen from cathedral at Hildesheim. Arcade of 13 arches; 12 filled each with a figure, the 13th a doorway. Smaller open arcade above. 25 ft. long by 11 ft. high. £81 10s.

6. Tomb of Filippo Decio from the Campo Santo at Pisa. Half reclining figure on top reading a book. The arms and book being partly free complicate casting. 6 ft. 6 in wide, 9 ft. high. £45.

7. Chimney piece from Hotel Lallemant Bourges, French, 16th Century. Large fireplace, carved projecting top and portion of ceiling. 12 ft. x 13 ft. £44.

8. Doorway, 15th Century Italian. Pilasters, lintel and cornice; all carved. 10 ft. 6 in. by 12 ft. high. £34 10s.

9. Portion of Dutch screen, with 5 elaborate 16th Century columns. 11 ft. x 6 ft. £9 18s.

10. Anglo Saxon cross, at least 15 ft. high, with low relief carving. £7 15s.

11. There are several valuable models to scale, of buildings or rooms. These appear to have been made to order but the cost is not attached. Models of sections of Italian buildings, decorated by painting, probably cost serious sums to produce; but possibilities are shown by a model of Fergusson's theoretical restoration of the Parthenon, which cost only 14 shillings.

Some of the Italian originals at the South Kensington Museum were got at prices which tempt one to stray from decision in favour of casts. £75 for a black marble doorway 9 or 10 ft. high, carved all over with cinque cento carving, is cost price or less; £16 for a carved stone mantel 8 ft. by 12 ft. is certainly less than cost. But buying prices are not what they used to be, and as a matter of fact these particular pieces are not such good work as the subjects in the cast room; and a cast on the same scale costs less.

If there is to be any dealing in originals, England is the country for it. There is a continual pulling down and rebuilding going on and good details find their way to dealers or to museums. The South Kensington Museum has some beautiful specimens of this kind, gifts from the owners of old buildings which were pulled down.

In fact it is well worth noting in conclusion that gifts to the South Kensington Museum far exceed in number and value, its purchases. It is also the repository of some fine collections which the owners have no means of housing themselves. At first as a nucleus, later as a recognized centre, the Museum has attracted gifts and loans, which is also instructive.

W. A. Langton.

THE FINK TRUSS BY GRAPHICAL STATICS.

By W. H. B., Berlin, Ont.

Professor Wright's solution in the March number is ingenious, and roundabout. Here is another:

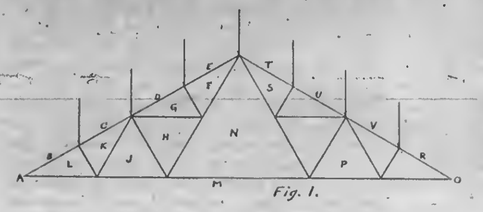

Fig. 1.

Assume a vertical load of 10 units applied at each panel point. Consider first the primary members of the truss, giving a frame of single triangulation, Fig. 2.

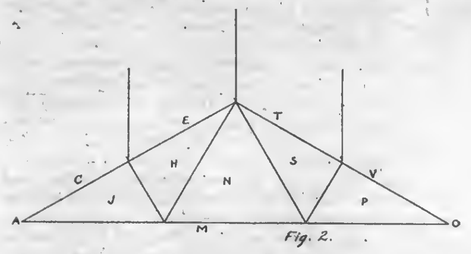

Fig. 2.

The load BC, 10, is carried 5 to A and adds 5 to CD; DE adds 5 to CD and 5 to ET; and so on. Ignore loads at A and O as they do not affect the frame. There remain loads CE, ET, and TV, 20 each. The stress diagram, Fig. 3, easily follows:

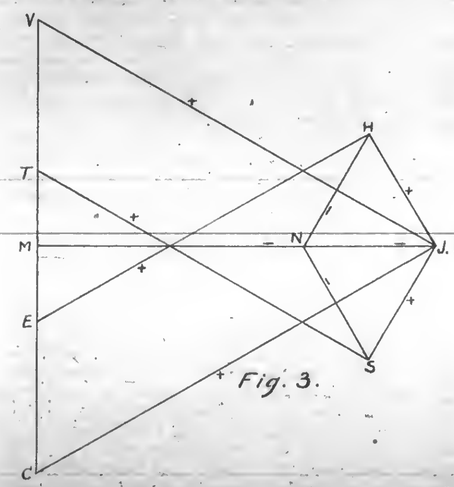

Fig. 3.

VTEC MV is the force polygon, made up of the loads VT, TE, and EC, and the two reactions CM and MV. It is a straight line because all the forces applied to the frame are parallel. Beginning at point O of the frame draw, in the stress diagram, from the ends of MV, the known force at O, the two lines VP, and PM parallel to VP and PM of the frame. The force MV, the reaction at support O, is upward. Following around the triangle in the direction given by that of the known force, VP is found to be in compression because the direction is towards O, the apex, and PM in tension because the direction is away from O. Mark these lines at once, in the stress diagram, + for compression and — for tension. Pass next to the apex SPVT of the frame, because the load VT and the stress VP are known. Draw PS and ST parallel to the corresponding lines of the frame. Both of these stresses are found to be compression. Proceed in like manner throughout the frame to the support A. For the closing line, the stress JC, the points J and C are fixed and the line must at the same time be parallel to the frame line JC Fig. 2. If the procedure has been correct this will be so. With the reaction line, CM, the operation is carried back to the point M from which it started, and the necessary check of its correctness is had.

Consider next the secondary stresses induced by transference of the intermediate loads to the main panel points. In the present case one determination only is required. Take the frame consisting of the triangles L and K Fig. 1, shown separately in Fig. 4. The supports are A and D. Fig. 5 is the stress diagram:

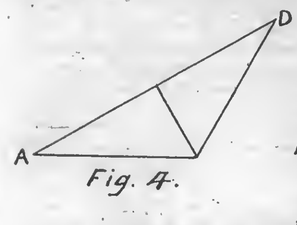

Fig. 4.

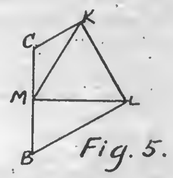

Fig. 5.

The stresses for the complete frame, Fig. 1, are obtained by adding the respective stresses of Fig. 5 to those of Fig. 3. BL Fig. 5, and CJ Fig. 3, give the required stress BL; CK and CJ give CK; BL and EH give DG; and so on. In the bottom chord the end panels only are affected by the secondary system. LK, KJ, and the similar members throughout the frame are affected by the secondary loads only, while stresses JH, HN, etc., are obtained from the assumed primary loading only.

It will be seen that this solution gives the same stresses as that of Professor Wright, whose solution would not be possible were the stresses LK, KJ, etc., due to anything else than the loads at the secondary panel points alone.

The solution given is for static symmetrical loading. The maximum stresses in a roof truss are due to drifted snow and wind pressure acting on one side only. These forces may cause reversal of some of the stresses due to static loads.

The term vector diagram is new, to the present writer at least. It may have a certain fitness in that the objective at any stage is the determination of two lines of which the directions are known. It is farfetched at best, and is an unnecessary innovation. And why deprive ourselves of the useful and expressive word "stress" which has the authority of Rankine and other foremost investigators? Professor Wright lacks a common word for tension and compression. Why interpolate "push" and "pull" when we may as well say "compression" and "tension" directly? The direction followed around the diagram governs in either case.

Some writers use — to indicate compression and + tension, on the mental association that compression subtracts from the length of a member and tension adds to it. It may be a matter of early training. The use of + for compression and — for tension has in its favor the practical, and graphically strong, argument that + is a good symbolical representation of a built compression member of a truss while — suggests a rod or bar, in tension.

THE ARCHITECT BEFORE THE LAW.*

By S. G. Archibald, Advocate.

Your President has asked me to give a course of three lectures before this Association on the subject of the Architect Before the Law, a subject as interesting as broad. It will not be my aim to cover the whole subject in detail, nor would it be possible for me to do so. I shall endeavor, therefore, to give you as complete an idea as I can, in the time at our disposal, of certain of the more important and vital questions with which architects have to deal in the daily practice of their profession, and I propose to begin with the question of the ten-year guarantee to which architects and builders are subjected.

An architect before the law is one who makes the plans and specifications for a building and who directs work, whose execution is entrusted either to a contractor or to workmen. The profession is, perhaps, the oldest of all professions. When Adam delved and Eve span, I presume Adam was his own architect; and when Noah built the ark, I presume, also, he was his own architect under the guiding hand of Providence. Since then architecture has advanced with advancing civilization and with its advance the law in respect thereto has become gradually more and more complete, more and more crystallized by commentators and judicial decisions. Our own law is that of the French law before the Code Napoleon, although that Code differs but slightly from ours on the subject.

The Architect must not only be an artist, he must be a "savant" as well. Mathematics, Mechanics, Physics, Geometry, Geology and Law must all be his in greater or less measure. For as Desgodets says, he cannot lay the foundation of a building if he does not know what ought to be observed between neighbors with regard to fences, wells, closets, cess-pools and so forth; he cannot erect it, unless he knows how he should place direct and side views, customary views and those of servitudes; and how he should place chimneys, hearths, furnaces, and galleries, and what contribution each neighbor ought to make to the mitoyen wall. He cannot cover it, unless he knows on what side and how, he must drain off the water; and finally he cannot tear it down unless he knows the precautionary measures which he must take with regard to the neighbors, who are always ready, at the least fault, to seek reparation from the proprietor. He might have added, that without some knowledge of the law of privilege, he will not know how to protect himself in respect of his payment for work done upon the building. In addition to this theoretic knowledge, his artistic sense must be highly developed, while on the other hand the range of his practical work-a-day knowledge must be almost unlimited.

As I have said, we will consider this evening the question of the "ten-year guarantee." The nature of the contract entered into between the proprietor and the architect is one of "louage d'ouvrage" or lease and hire and work—a contract by which one of the parties agrees to do something for the other in consideration of a certain price. Thus the architect leases his work represented by the plans and specifications and by his time and attention if he also directs the construction. Now, as a rule, and as a matter of common law, the reception by the proprietor of work done releases the workman in respect of that particular work, in the absence of fraud on his part; but our law governing architects in this regard is found in Articles 1688 and 2259 of the Civil Code of Lower Canada which derogate from the common law and are as follows: (1688) If a building perish in whole or in part within ten years from a defect in construction, or even from the unfavorable nature of the ground the architect superintending the work, and the builder are jointly and severally liable for the loss; and 2259 says, "after ten years, architects and contractors are discharged from the warranty of the work they have done or directed."†

While at first sight this guarantee may seem to some unduly severe, yet reflection will lead to the conviction that it is a most salutary measure. In passing this law the Legislature had a three-fold object:—the proprietor was to be protected against his own ignorance, the architect and builder against their carelessness and neglect by means of this wholesome threat, and the public from the danger to which it might be exposed from the ignorance of the former and the carelessness of the latter. We thus see that not only are private interests at stake, but also public order, and this principle will be found the very fountain and source of the architect's weighty responsibility.

What structures does the Code refer to when it says in Article 1688, "if a building perish," and in Article 2259—that architects are discharged from the work they have done or directed. Taking these two articles together, the Courts in France have decided that any habitation, no matter how small, for men or animals, would be considered a building. Greater repairs, modification of old buildings which would affect the solidity of the main building, the establishment of a well, of a bridge, of a terrace wall, or of chimneys have all been held by French authors to be works subject to this guarantee. Accessory works not affecting the solidity of the structure itself, would, however, not come under this heading. The question of fact in each particular case must be decided by the Court on its merits, but this guiding principle must prevail, that there is only a guarantee in respect of immovable constructions, and where time alone will discover the defects thereof.

Now, what classes of people are subject to this guarantee? Evidently not the manual laborer who only leases his services. There is no "lien de droit" between him and the owner and his liability, if any ever attaches to him, is that of the general law, that everyone is responsible for his own fault. On the other hand, the lessor of work, whose object is an immoveable, is liable to this guarantee and these lessors are architects, builders and civil engineers. Under Article 1696, masons, carpenters and other workmen who undertake work by contract for a fixed price are subject to the rules prescribed in this section. They are regarded as contractors with respect to such work. The position of the sub-contractor has been the subject of a good deal of discussion and the French authors are divided upon the subject. Those who maintain that, as there is no "lien" between the proprietor and sub-contractor, he should not be subjected to this guarantee, have the weight of jurisprudence on their side. And indeed if this were not so the principle of public order would be violated inasmuch as persons without skill and without experience would take contracts with the sole object of sub-letting them. Such a system would result to the advantage of the careless and ignorant builder, and it would multiply litigation in multiplying sub-contracts. Generally speaking, therefore, we may say that those only are subject to this guarantee who have undertaken directly with the owner either the conduct or the construction of an immoveable or of an integral part thereof.

The architect with respect to the proprietor may occupy two different positions, and his responsibility will vary accordingly. He may only furnish the plans and specifications—or he may, in addition, direct and control the work. What then will be the extent of his guarantee where he only furnishes the plans and specifications? With regard to the plans it is evident that he can only warrant them in so far as they have been faithfully followed. His liability therefor, will only be for defects which are the necessary consequence of the plans which he has drawn or of the specifications which he has given. Supposing that for motives of economy the proprietor himself employs the workmen to execute plans furnished by an architect, and after the building has been constructed some five or six years, it threatens to fall down. The proprietor, in order to exercise a recourse against the architect would require to prove that the plans and specifications had been followed, and that the defect lay in them and not in the construction—such a defect, for example, as a weak foundation or insufficient beams, and so forth.

So also with respect to the material, the architect will only be liable for the nature of the material which he specifies, but not for the quality used by the contractor. Thus, an architect who specified wood where he should have specified steel, will be liable if the building be endangered on that account. On the other hand, if he specify a material commonly believed among architects to be proper material, he will not be so liable.

A very much more important and interesting question presents itself with respect to the architect's liability for defects in the ground, where he only furnishes the plan. This point is very much controverted. Some of the French authors and notably Lepage and Guillouard consider that the architect has no responsibility with respect to the soil, inasmuch as he may never see it, but that the contractor who is on the spot must answer alone for this. On the other hand, though this guarantee may seem almost too rigorous, there is the question of public order and safety to be considered, and the sounder conclusion would seem to be, that the architect is charged with this responsibility. The proprietor asks for a plan for a certain piece of ground. How then can the architect answer for the soundness of his plan if he does not examine the ground? How will he be able to tell of what depth his foundation should be without a careful examination of the soil? This, it seems to me, is the very first thing he should do and besides is a thing which falls specially within the sphere of his particular knowledge. Without such an examination his foundations will be the merest guess work—someone must be liable. Shall it be the contractor alone, who, as a rule, has not so special a knowledge as the architect in that respect, and who, on discovering the fault in the soil will have to come to the architect to notify him that his foundations are insufficient, and that he would do well to visit the ground in order to get some idea of what his foundation should be. Surely not. A defect in the soil is intimately connected with a defect in the plan because the plan must vary according to the soil. An error in this respect would be rather an error of conception than of execution. I am, therefore, of opinion that the architect is liable for defects in the ground even when he only furnishes the plans and specifications. It goes without saying that these defects in soil for which the architect is liable, are only such as a careful man, versed in his profession would discover upon a reasonable examination. The architect's responsibility then, is this: that he must answer for his plans, for the nature of his materials, and for the soil for which he has drawn his plans—and, of course, under the common law for his own fault which causes damage to the owner, even when the solidity of the building is not in question. If, for example, he were asked to give plans for a school capable of accommodating five hundred pupils, and after construction it was found that 300 would crowd it, he would be liable in damages for this fault. If, however, as is generally the case, the architect also direct the work, his responsibility is still more weighty. Besides, all of the obligations to which the architect who only furnishes the plans is held, he must warrant their proper execution, must see that the materials are of the proper quality and are properly used, and, generally speaking, is responsible for everything in connection with the building.

Not only, in this case, is the architect liable for defects in the soil, but he is liable for defects in construction which are only such on account of the peculiar situation of the building. Thus, for example, if the house is to be erected on a high bank exposed to heavy gales, it would be a vice of construction to roof it with slate if experience had shown that that class of roof could not properly resist heavy winds.

With respect to materials furnished by the owner, the architect is not liable unless a reasonable examination would have shown him their defective nature. If, on the other hand, they are furnished by the contractor, there can be no doubt of his liability, saving always his recourse against such contractor.

All defects absolute or negative other than those of soil or material may be called defects of construction—such, for example, as too weak foundations, insufficient dimensions of any of the materials, or a lack of proportion between the different parts so as to affect the solidity of the structure.

In addition to all this there is a presumption of defect in construction under the law, when a building threatens ruin within ten years without extraordinary reason.

But not only are the architect and builder jointly and severally liable for their own work, but they are liable where they have gone on with work already commenced by others; the architect is liable where the plans are furnished by another architect, and the builder is liable where he goes on with work commenced by another. The leading case upon the subject is that of Wardle vs. Bethune, which was carried to the Privy Council. The facts in that case were as follows (R.L. 637):—

Wardle, a builder, contracted to build Christ Church Cathedral, in Montreal, according to plans furnished by an architect and upon foundations laid by a previous contractor and approved by an architect having charge of the work. Before the cathedral was finished the tower sank and damaged the building. The cause of the sinking was found to be the insufficiency of the foundation as planned by the original architect and constructed by the former builder. This defect, though not patent, might have been discovered by Wardle. It was proved at the trial that Wardle had no knowledge of, and took no part in the testing of the soil or in the designing or planning of the building or foundation. Under these facts the Privy Council held that the builder was responsible for such defects and was not freed from liability either by acting under the direction of his employer's architect, or by reason of the fact that the defective foundations were the work of a previous builder. This judgment was a confirmation of judgments already rendered in our Superior and Appeal Courts.

The legal question was very fully gone into on both sides and a mass of authorities cited. Counsel for Mr. Wardle argued that as the foundations were not contracted for or executed by him he could not be liable for any defect in their execution nor for any defect in the soil upon which they were built. He was only bound to put the building on the foundations as they stood, and having done that properly he had no further liability. The plans and drawings were made by an architect employed by the Cathedral, and he, and not the builder, should be held liable. For the Cathedral, the case of Brown vs. Laurie, the leading case in our Courts, was relied upon and it was contended that both under the old French law and under our law the builder who constructs on insufficient foundation is liable even though he acts under the orders of his employer's architect. If the obligation to answer for the foundations is a necessary part of the obligation to warrant the stability of the building, how can a distinction be made between a builder, building on his own foundation, and a builder building on a foundation made by another builder. And if a builder is not relieved by following the directions of the architect, how can he be relieved, by the fact that the foundations were already laid, from the duty of examining them. In this case, as in all others of this nature, the element of public policy is not to be lost sight of. In rendering judgment in this case, their Lordships referred to Brown vs. Laurie, and adopted the principles there laid down.

Their Lordships, after a discussion of the case went on to state, that the broad general rule of law—the rule certain for architects and builders in the execution of the works entrusted to them—is that there is annexed to the contract, by force of law, a warranty of the solidity of the building, that it shall stand for ten years at least; that the approval and directions of a supervising architect, or his omission to ascertain the nature of the soil of the foundation, by known and available tests does not exonerate the builder from the consequences of following such direction, or of building on the foundation without making himself sure of its sufficiency.

In connection with the same building, Scott, the architect, sued Christ Church Cathedral for commissions due him. The defence was that the Church had suffered dam-

* A series of lectures prepared for and delivered before the Province of Quebec Association of Architects, 1903, and published by permission.
† In the Province of Quebec.

age, for which he was responsible, which more than offset any commission due him. Scott answered that he had faithfully followed the plans of Mr. Wills, the architect, who had first been engaged for the building, and that he was not liable for defects in Mr. Wills' plans. This pretension was overruled and the Courts laid down the principle that an architect was liable even where he only followed plans of another architect handed him by his employers.

The architect is liable along with the builder for errors committed by the latter, because he is held to see that a work well conceived by him is well executed by the builder—this doctrine was illustrated in a case of McDonald vs. David, 14 L. C. R., 31. In this case the floor of a building on St. James street had sunk in consequence of the insufficiency of the timbers used to support the joists. It was there held that the architects, as well as the carpenters and joiners employed in the erection of the building, were jointly and severally liable for the damages incurred.

It was held in a case of Cowen vs. Evans that where a contractor undertakes certain works for the proprietor of a building for a certain price, independently of the other contractors, and not having the general direction of the works, he is not liable for the faults of the other contractors. In this case Cowen put a brick wall on the stone foundation of another contractor; after his wall was up some way, he found defects in the foundation, pulled down his wall, and sued for annulment of the contract. He was answered that he had accepted the foundation and was responsible for it. This plea was dismissed, the Court rendering judgment in the sense just quoted. The architect must also warrant that he has not violated any of the municipal regulations or any of the laws of neighborhood. Thus, if a mitoyen wall be pierced without the neighbor's consent, or if a chimney hearth be placed directly over beams of wood, or if a well be dug near a neighbor's wall without any counter wall being provided for, in all this class of cases the proprietor could recover not only the damage to his own building but whatever he may have been compelled to pay his neighbor for damage done to him. The architect must build so as to leave no room for any complaint on the part of the neighbors. This guarantee must be distinguished from the guarantee of solidity on the part of the architect, from which he is relieved after ten years. Under Article 1053 of our Civil Code, everyone is liable for his own fault which causes damage to another. Prescription, therefore, of this action will only begin to run against the owner from the moment when he had knowledge of it and would not be acquired in favor of the architect for 30 years from that date. This, at least, is the opinion of the majority of the authors, though Duvergier, Troplong, Fremy-Ligneville and Perriquet consider that it is prescribed in ten years—and is in the same position in that respect as the guarantee with respect to solidity. This, however, is hardly a question of practical utility. It will be time enough for you to discuss it, when you are actually troubled with it. If a fire were caused through a beam, placed underneath a hearth, becoming ignited, the action against the architect would lie from the moment of the fire whenever it occurred, and would only prescribe by thirty years. The guarantee of solidity, on the other hand, only lasts for ten years, because the law has fixed this as an arbitrary period after which the building will be presumed to have fallen through some other cause than a defect in construction. The practical effect of this is, that a defect which doesn't threaten the ruin of the building for ten years is no defect at all.—Even should the whole edifice crumble to the earth in its eleventh year, yet would there be no liability on the architect's part, if no fraud is alleged against him. Not only is there a presumption that the building was properly constructed; there is more, there is an actual bar to any action on the part of the proprietor, who will not be admitted to prove, even out of the mouth of the architect himself, that there was any defect in construction. Questions of guarantee, however, are of no importance the moment fraud is alleged. Everyone is liable for his fraud. If, for example, you have purported to build a stone wall three feet thick, but have in reality filled in the centre with rubbish and have merely put on a stone facing, you could not possibly hope to be discharged in any other way than by thirty years without action on the part of the owner from the date of the discovery of the fraud.

We have seen that the architect under the law is liable for every derogation from the principles of his art and for every infraction of the rules and laws which, as a professional man, he ought to know. Can he, by contract with the proprietor, rid himself of this weighty burden of responsibility? What if, when he has pointed out to the proprietor the defects in the soil or in the material or in the plans furnished him, the proprietor insists on his proceeding and contracts to relieve him from the guarantee imposed upon him by law. What then is his position? A glance at the principle in virtue of which this responsibility is placed upon the architect will give us the answer. Public order and safety are concerned, and private individuals cannot by contract derogate from that which concerns public order. The architect is not relieved in such a case and his duty to himself and the public is to refuse to proceed with the work. It, of course, goes without saying that he is not responsible towards the proprietor who has so released him, but he would be towards third persons damaged in any way by the ruin of the building.

It is often important to establish the exact day from which this guarantee will begin to run, and this will be from the date when the work was received. It will always be safer to have this fact fixed by a writing. All doubt upon this point will then be removed and the interest of both proprietor and architect better served. The question of prescription of this action has some theoretic interest, but is not of practical importance for the moment. It is contended on the one hand that the arbitrary term of ten years puts an end to any action against the proprietor even though the building have fallen down within the ten years. In other words, the owner must sue the architect before the ten years have expired. On the other hand it is argued that the fall of the building within ten years only gives rise to a right of action, which right will only be prescribed by thirty years, and this latter view seems to me the more sound of the two. The question of burden of proof with respect to this guarantee is a most interesting and important one. Does article 1688, when it says that the architect and the builder are jointly and severally liable for the loss, if the building perish within ten years from a defect in construction or from the unfavorable nature of the ground, mean that they will be held guilty until they prove themselves innocent, or does it simply bind them for ten years, when without that article they would have been discharged by the reception of the work? It can readily be seen how vitally this question interests the architect. Who must prove his case—the plaintiff who demands damages or the architect, who says "I am not responsible?"

At common law the reception of the work would discharge the workman. The proprietor has had an opportunity to examine it; has examined it and has received and paid for it, and the workman's responsibility ceases. But in this case Article 1688 specially derogates from this principle and says "architects and builders must guarantee their work for ten years." The French authors are very much divided upon this question. Troplong, Duvergier, Guillouard and Laurent argue that fault is not presumed and that all Article 1688 intended was to carry the architect outside the common law which would have liberated him from the moment his work had been received by the proprietor. These are onerous sections and must be interpreted strictly and the very fact of the reception of the work creates a presumption that it was well done. The article does not say that they are presumed to be in fault, it simply says that if the defect exist, they are liable for it. They argue, therefore, that the proprietor, plaintiff, in responsibility, must prove the fault which he alleges.

On the other hand, Marcade, Fremy-Ligneville, Aubry and Rau and others consider that until the architect clears himself the damage caused will be presumed to be caused by his fault. This contention has the advantage of being supported by the jurisprudence in France. In my opinion, it is the correct solution. A building which falls down can only do so through defect of construction, material, or soil, or on account of some extraordinary event which could easily be established in proof. Now the architect for ten years must guarantee the building against all these causes, save the last, and it will be perfectly easy for him to make affirmative proof of any fortuitous event which may have caused the ruin, and if he can't do this, he is liable.

If this were not so, you would force the proprietor to make negative proof; because, if he must prove that defects of construction caused the ruin, he must prove the particular defects, and this, in cases where the building had fallen down, might be very difficult proof, indeed, for him to make. He would often be forced to attempt to prove that nothing else could have caused the ruin, forced to go through a process of elimination, in fact forced to make negative proof. I do not believe that that was the intention or the spirit of the law. As I have already said, the Legislature in placing this heavy responsibility on architects and builders, did so because public order and public safety were involved. Architects and builders must, at all cost, be thoroughly alive to the importance of building well and safely, and that is why this salutary burden was placed upon their shoulders. The building must stand for ten years, or the architect must show good cause for its not doing so. While this interpretation may not be in accordance with the exact wording of the Code, yet I do think it is in accordance with its spirit.

The Privy Council in the case of Wardle vs. Bethune already cited, while not called upon to pass upon this point, gave expression to the opinion that the onus would be on the builder in the circumstances under discussion.

It is hardly necessary for me to say that this liability of the architect or builder for the whole amount of the damage suffered, has only reference to the proprietor and that as between themselves each is liable for his own fault. Thus the architect would alone be liable for defects of construction depending solely on defects of plan. On the other hand the builder would be alone liable for his own mistakes, where the architect had only furnished the plan. Where the architect has also directed the work, each is liable for his own fault. The builder would not be received to set up the negligence of the architect with respect to a fault committed by himself. As regards third parties Article 1688, which we have been discussing, would have no application. The architect's responsibility towards them would be governed by the general law contained in Article 1053, that every one is responsible for his own fault which causes damage to another.

We have seen, therefore, gentlemen, that you are under a serious responsibility to look to it that the buildings you erect are solid and built according to the rules of the profession to which you belong, and further that you cannot liberate yourself from this burden even by contract with the proprietor, because as private individuals you cannot derogate from the laws of public order which concern all citizens and to which all private interests are subordinated.

MONTREAL LETTER.

No. I.

MONTREAL IN GENERAL.

To the student of architecture to whom the cities of Europe are beknown, some for their ostentatious splendours, others for the sake of old world charms, arrival at Montreal brings a new sensation and not one of unadulterated pleasure. Every town has its architectural character just as it has its specific odours. The best way to understand this architectural character is to arrive late in the afternoon, to feed at some famous hostelry and then sally forth into the waning light to get the general impression of things—to cross the great squares and steal around the high cathedral walls what time they stand up in all their grandeur of scale in ever deepening silhouette against a lemon sky. Daylight means details to the roving quizzical architectural eye and, details are architectural accidents whereby much good work is spoiled and little bad work is redeemed. At dusk the details are washed out and a first impression at the magic hour may be the truer as it certainly is the more lasting on this account. Unfortunately steamers which have spent the night at anchor between Montreal and Quebec are apt to arrive in the morning and after the beauties of the St. Lawrence it is forcibly brought home that "God Made the Country and Man Made the Town," and the comparison of workmanship is trying to the latter. Thus it is conceivable that the sensation above referred to may have suffered by unfair comparison and too much sunshine upon a a certain fair September day.

But to return to the general architectural character of the place, which is over theme, it must be understood that the writer finds there are many expensive buildings and some handsome ones in Montreal; there are a few really good buildings and a very few exceedingly beautiful ones, but all these are but a drop in the bucket and the average structure fronting on her streets is neither good nor beautiful—rarely sensible.

Architecture is a public art—the only truly democratic art—and a few isolated private examples however good will never redeem the architectural character of a city where the citizens dwell in ugliness. What makes the sensation above alluded to different from that produced by many other cities is the fact that there is so little decent building tradition manifesting itself. Where houses do not stand cheek by jowl they are most of them afflicted with one front and three backs and the backs are as a rule the less offensive compositions judged in pure elevation. Where houses stand hard up to each other the prevailing ideal is differentiation—this is attained by recourse to enormities in wood work with the underlying idea of a balcony as an excuse, or to crimes in zinc perpetrated with no excuse at all and a very light heart. Of material frauds—wood masquerading as stone, etc.,—there is no end. Amid these distressing reflections there is one ray of hope: this caricaturing of Architecture is only a phase in the city's development, and from its very unserviceableness will succumb the rigours of a climate (which by the way a new arrival has no right to mention.)

A little closer inspection reveals the fact that two serviceable types of plain house were evolved in Montreal a short time back and it is deplorable to think that the excellent traditions of which they are manifestations have not struck deeper roots.

There are in Montreal many plain limestone houses—some quite plain—others with a soupcon of French architectural instinct—not very sincere but quite charming. Substantial houses these are, built of fair blocks of stone with reasonable tin or iron roofs and decently proportioned chimneys and windows. There are none of them quite good enough to be worth an architectural student's trouble to make measured drawings of, but they are the best things on the streets and represent a once live local building tradition at least—the kind of tradition, that is, with which the architect must saturate himself if his work is to be indigenous at all. It is the curse of the modern house that it usually proclaims pretty clearly of what stock it comes, and hides as far as possible every hint of having been bred on the soil on which it stands. Local tradition has quite died out of the building trades in most parts of England and on this side many of the towns have not yet got the length of a tradition at all; but here is Montreal with a very excellent tradition in quet grey stone houses—and the tradition appears to have been plucked up by the roots about two score years ago, since when, chaos!—confusion worse confounded. The other type is in brick. Red brick, green shutters, white window frames, a medium pitched roof—what more can any designer want? Properly used these simple ingredients have been combined to form streets it is a pleasure to walk down, far more to live in; yet this type too has given place to the vulgarities above alluded to, and is no longer put up—nay it is being pulled down in several places at this moment.

The problem of winter glazing outside the ordinary window frames has been solved in Montreal in a more slovenly way than in other civilized cities subject to a "cool" winter. The appearance of a house depends immensely on the external window finish, and for four months of the year every house in Montreal wears spectacles which spoil the expression of eyes that might be quite pleasant. In Russia and Northern Germany the double glazing has been solved in a variety of ways, neat and handy, some of them very ingenious and all without recourse to the barbarous expedient of slapping a rough chamfered frame of inferior glass on the outer edge of the window opening.

The real difficulty which has not from its nature been better solved elsewhere is the roofing question. The slates of Montreal are very good and very ugly, and they don't improve or deteriorate with the kindly hand of time. Lead is no use. Copper goes as black as the slates. The good old tin has been out of the market goodness knows how long. Zinc and iron remain, and the genius who could give artistic expression to these obdurate and unsympathetic materials is not yet in evidence. A medium pitch roof has to be cleared of snow, a steep pitched roof is a danger to the community—a flat roof remains the best solution, but how is a building as a whole ever to look right even in the glory of evening light and growing shadows with its top shorn off and its chimneys growing like mushrooms, here and there, in a desert of asphalt and gravel?

Yes, the architects of Montreal have their little problems to solve and by degrees, if properly faced, the architectural character of the place will improve, but it is not solving the problem of designing for a flat roof treatment to put an 80° slate slip above the cornice just as an acknowledgement of the old habit of slating roofs, while a flat roof is concealed behind, nor is it any use relying on zinc "wheriligigums and whigmaleeries" to distract the attention from the drawbacks of a dull sky line.

There is a little and a very little good old work in Montreal—a closer study of it would do much to improve the present state of things.

There are a few and a very few beautiful new buildings in Montreal—and these willbe recorded from time to time by the

GARGOYLE.

PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS.*

Address by John S. Archibald 1st Vice President.

There comes a time in the life's journey of everyone, when it is advisable and advantageous to stop and calmly survey the road recently travelled. Such contemplation may not always be pleasing for the reason that no matter what the results may have been we feel convinced that if we had to travel the same ground over again we could improve on the past and the results would be more satisfactory. Faults become apparent in the perspective of time, lost opportunities stand out strongly in vivid contrast to the background of what little has been accomplished and results which called forth extraordinary effort, seem, in the blue haze of the distance, to become pigmy and insignificant. Such are usually the first thoughts which strike us. Yet when these depressing mists have been brushed aside, we begin to see and realize the steep hills successfully travelled, the may milestones passed, and here and there, the seeds sown on the journey springing up and bearing fruit according to the quality of the seed placed in in the hands of the sower. And so it is with the life of our Association. We are now entering upon the 14th year of its existence, and from the point of view of time and circumstances, I consider it advantageous to glance over our past history with a view to finding out if any work whatever has been accomplished, what that work may be, if the results obtained can be considered satisfactory and on what lines must the work continue.

The Association was brought into being on the 30th December in the year 1890, when, at that time, the Act of Incorporation was assented to by the Lieutenant Governor in Council.

I have very little to say regarding the first period of the Association life, viz., from the date of its inception up to the year 1898. At the same time, we cannot be too loud in our praise of those members of our profession who recognizing their duty to the public interests, comprehending the immense responsibility placed upon the shoulders of the followers of our profession in the Province of Quebec, and being alive to the possibility and advisability of advancing the art of Architecture by united efforts along recognized lines, bent all their efforts to obtain the original charter. These members have every right to congratulate themselves on being the pioneers of compulsory registration of architects on the Continent of America. At this late date it is difficult to realize the mightly obstacles and prejudices that had to be overcome, and when we to-day discuss this phase of the question, we are apt to forget the labour and toil which terminated in such a successful issue. Their example has been followed by the State of Illinois, and many attempts have been made to have a similar law enacted for the Province of Ontario, and I am strongly of the opinion that some of us will live to see the day, when the work begun in the Province of Quebec, will branch out and bear fruit from the Atlantic to the Pacific, and we shall have the practice of the profession recognized in law as of such importance as to merit the attention of the Legislative bodies and result in the passing of enactments similar to those under which we now govern.

It is true, that up to 1898, the work of the Association was limited in extent, but this I consider was a necessary probationary period, wherein its limited membership became alive to the scope of its usefulness, its possibilities and even its drawbacks; and even at this time it began to prove its usefulness to those of the profession who were not included in its membership, for it was often used as a shield behind which they were pleased to protect themselves. In the public eye it justified its right to exist by demonstrating on every possible occasion that it existed primarily for the protection of the public and for the fostering of art. It is not surprising therefore that when amendments to the Charter were desired in 1898, all parties recognized the right of such an Association to exist, and as a result, little or no opposition was met with.

From this period, the scope and usefulness of the Association is now enhanced and the horizon has extended.

It is on the work of this second period that I desire to dwell for a few minutes, not with a view to bolstering up a case for congratulation, but with the objects stated in the introductory remarks.

The first step that was necessary after the charter had been amended, was to perfect the organization. To the Association this was imperative, in order that full benefit could be taken of its provisions. The machinery put into the hands of the Association was complicated and required the most careful study and investigation. It was necessary that the members of the Council at that time make themselves thoroughly familiar with all its different parts, to examine its mechanism in every respect, and where possible to test it under action. This all took time, and those of you who have been members of Council during the last five and a half years, will remember the difficulties and tribulations which we had to undergo. In some respects the provisions of the Charter turned out satisfactory, but in other respects it is found to be entirely inadequate. In spite of the careful consideration that was given to its compilation, errors have been noted, omissions discovered, and in some cases what can be called by no other word than "carelessness."

In the 8th annual report, presented to the members in 1898, we read "The arduous task of the material organization is now nearly completed and the Association can congratulate itself on having secured an authority much coveted by many similar Associations and from other points of view, much more influential than ours. Not only the interests of the profession but more especially those of the public, are now protected against incompetent and doubtful practice." According to this everything appeared rosy and hopeful, but under the experience of the past five and a half years, we are forced to the conclusion that there is great room for improvement in our charter. The protection of the public, spoken of, amounts to nothing, for no matter how incompetent a man may be to practice the profession of Architecture, our charter has got no authority over him unless he designates himself "Architect." The usefulness of this designation becomes apparent when we realize the fact that buildings are going up around us every day from plans drawn by persons other than those of the profession, and yet we cannot even step in and say "nay." Even when someone does transgress the law, we are met with the difficulty that no provision has been made in our charter for naming the court in which the case ought to be tried and we are therefore open to the danger that, under certain circumstances, the Association might be mulcted in heavy damages when prosecuting. Even in the case where members, after belonging to the Association, have fallen into arrears, we find that under our charter we cannot sue them for such arrears. The time has therefore come when we should look the matter boldly in the face with a view to amending our charter along the lines of greater possibilities. There should be no difficulty in having our charter amended, that the practice of the profession would be protected instead of the mere name of "Architect" and thus make it impossible for any individual to undertake architectural work unless having undergone architectural training on the lines laid down in our charter.

During this period, the by-laws governing our Association have been amended in many respects. This arose from a closer acquaintancesh p with the work, and the by-laws governing the examinations have received much attention. This question of the examinations has at all times been a difficult one to contend with, but under the new by-laws, it is anticipated that all, or nearly all the difficulties will be removed and the work of the Examining Board made much simpler.

SECOND—DUTY TO THE PUBLIC.—The Association has at all times recognized their duty to the public and much good work has been done in this respect. We see evidence every day of the public becoming educated to a higher standard and appreciation of art and for this no small meed of praise is due our Association, for they have, by means of lectures, exhibitions, and the mere fact of the existence of such an Association, exercised a leavening effect on the public mind. In our city, the building laws were drafted by the Association, and by steady, persistent effort, have passed into law. It is undoubtedly true, that there is great room for improvement in these by-laws, yet we have established the principle and precedent that we, as a body, have a right to be heard and our views receive every consideration.

The Association should at all times keep an eye over the regulations governing the erection of buildings in the city, to protest against any tinkering that might result in depreciating their value, and at all times seize the opportunity to have them amended and improved in the public interests.

That we as a body have been considered worthy of attention is evidenced in the action which crowned our efforts in the appointment of an Architect to the Building Inspectorship of this city, and this department of the city work has graciously received any suggestions from the Association, made in the interests of our profession or the public.

It is more directly in the public interest that legal proceedings were taken against those persons who violated our charter.

*Delivered before the Province of Quebec Association of Architects, March 15th, 1904.

This work has always been done in a quiet way, and it is no doubt from this fact that much of the criticism has arisen, but the Council have always felt it incumbent upon them to perform this part of their duty with as little noise as possible, recognizing the fact that this part of the work of our Association, while being a necessity, does not redound to the glory of our profession. It is often said that the Association does little or nothing respecting the taking of legal proceedings against offenders of our Charter, yet in one year alone, eleven actions were entered and no year has passed which has been free from some action or other, but whereas we are a liberal profession and as such should be imbued with the highest ideals, legal proceedings are never entered, and I hope never will be, unless all other means possible fail to bring about the desired result.

Efforts have also been made to safeguard the public interests in other respects. Efforts have been made to establish a precedent, and in fact to make it law, that when any public buildings are to be erected by either Federal, Provincial or Civic Government, that means should be adopted to call forth the best that the profession can produce. It is to be regretted that we have not been more successful, but yet we must not give up the struggle; we must persevere, and some time, when we least expect it, our continued knocking may be heard.

THIRD—EDUCATION.— One of the duties laid down in the preamable of our charter, states, that it is "Expedient to insure a standard of perfection in the present practice of our profession in the province of Quebec." We think that considering the age of our Association, this duty has been well recognized. The work has been of the first importance and has taken up a considerable amount of the Association's time. It may not have resulted in all that might be desired, but there is nothing perfect under the sun, yet there is cause for congratulation. The recognition of the necessity for proper architectural education is one of the paramount causes of our being, and while the work must necessarily be arduous and require much painstaking, it must not be shirked.

Being empowered by the charter to make it compulsory for all students to pass certain examinations before being permitted to practice, the Association acknowledged it as their duty to place before these students such information as would be necessary for them to acquire before presenting themselves for examination. As a result, our library has been greatly enlarged and now contains many useful and valuable books. These are being added to from time to time and before many months have elapsed, our library will contain all of the books suggested as authorities to be studied in the pamphlet regarding examinations. Of course our purchases, in this respect, are limited to the amount of money at our disposal and this is very limited indeed, and recognizing this fact, your Association made arrangements with the authorities of McGill University, whereby the Architectural Library of this seat of learning was thrown open to members of our Association. This is a valuable acquisition, and the members should show their appreciation of such liberal consideration by exercising their right of membership on every possible occasion. Our Association has also exercised some influence over architectural education, as taught at McGill, the authorities of which have at all times received our suggestions with kindest consideration and have profited by them on every possible occasion.

In the recognition of our duty to the cause of education, a scheme of scholarship has received the attention of the Council for nearly two years and has now become an accomplished fact, and we trust that by the time the term of scholarship has ended that means will have been provided for following it up with a travelling scholarship.

We might also point out the connection that has been established with the R.I.B.A. of England, that well known pioneer of collective effort, and as a result of the efforts of some of our members, it is now made possible for anyone to present himself for their examination in our city.

Still, in spite of all that has been done regarding education, I will admit, that if we are to live up to our ideals and to our duty we have to go much further. As the Association is dependent upon the ranks of our students and draughtsmen for its coming practitioners, we should endeavor to inculcate in their minds such feelings of self-interest and good fellowship as will make them aspire to the ranks of our membership. As a parent body, we must take an interest in their educational welfare and we should therefore endeavor to bring them together in our rooms, to bind them together by some junior Association and to undertake courses of systematic lectures. The Association should also be jealous of their right and opportunities given them to educate the public in the art of Architecture.

Courses of public lectures should be given at stated intervals and thus interest the public in the possibilities of our art with a view to a higher appreciation in their own particular case, and eventually bring a stronger force of public opinion to bear on the problem of the architectural improvement of our own city.

FOURTH—MUTUAL IMPROVEMENT.—The duty of the Association to its own members has not been overlooked and I expect that it is under this title that we will encounter the greatest criticism. The success or otherwise of the Association in this respect, depends entirely upon the point of view of the critic. Some criticise as if the question of our Professional Tariff was of the first and vital interest. Others are ready to judge the value of the Association by the number of legal proceedings that have been taken against offenders, while a few believe that our first duty is to the public. They may all be right in their way, yet it is my humble opinion that we are formed into an Association, first, for the public good, and second, for the good of the profession—and the majority of the profession at that—and judging by the work of the past Councils, I am not alone in my belief. After several attempts our tariff was at last amended and passed by the Lieutenant-Governor in Council. You are thoroughly familiar with the facts of the case and it is useless now to repeat them. True, it was not the tariff that was passed by the Association, but I for one will frankly admit that I would rather have it than none at all, for at least we have the principle accepted and established that architects have a right to a Tariff that will be accepted at law. To my mind, the tariff as amended is a standing lesson to architects to be more business-like in their methods. Who among us, would give out work amounting to any considerable amount, unless the contractor is tied hard and fast by a written contract. In the name of common sense therefore, why should not all architects be compelled to enter into a written contract with their clients so that all possible future difficulties would be removed at the outset. It may be that the neglect arises from the feeling that it might be awkward to place the question of commission before the client at the outset, and hope that he will take this for granted and that matters, in this respect, will run along their own smooth course. No one is compelled to work for three or four per cent., even although such amount be stipulated in the tariff. Suppose you are offered work at 3 per cent. would you accept it? (Let us hope not.) Then on what different basis are you when the legal tariff places the commission at 3 per cent. It merely amounts to this, that it is your duty to yourself and to the profession, to inform your client, that where such a clause becomes operative, that you require a written agreement for the full professional charge. Surely you are not going to allow the law to dictate the value of your services. You are the best judge as to what your services are worth, and tariff or no tariff, your self respect should be the best judge as to what commission would remunerate you for the services rendered. Do not suppose for a moment that even if the legal tariff was satisfactory that the problem would be solved. There is nothing to hinder an architect working for less; it is purely a matter of conscience; you cannot make men honorable by law and you cannot lay down by statute that no man shall be allowed to work for less than the stipulated amount. It is purely a question of labour and hire. On the other hand, it is the duty of everyone in the profession to get a higher remuneration wherever possible and if the services justify it, and no stumbling block whatever will be put in the way of an architect who desires to obtain a higher remuneration for his work.

The tariff as passed by the Lieutenant-Governor-in-Council is the minimum where no written agreement has been entered into. Every servant is worthy of his hire, and if law places the minimum on any particular services, there must be some higher rate. It is therefore the duty of those who feel themselves capable of giving more than the average return, to endeavor to get a higher remuneration.

We hear much of the desired amendments to our legal tariff along certain lines, but I go further and say, that it is the duty of our Association to raise the minimum wherever possible and wherever justifiable, especially when we consider the extraordinary complexity and the knowledge required in our professional work in these later days; the tariff which was formed years ago when architectural work was of a simpler nature, is at present entirely inadequate.

A careful watch has always been kept over the interests of members in the legislature and elsewhere, and occasions have arisen when, without the help of an Association such as this, all efforts to safeguard our interests would be abortive.

Attempts have been made to reduce the period of responsibility of contractors to four years and to leave the responsibility upon architects according to the original ten year term. This was successfully frustrated.

In a case that has recently been decided in the Court of Appeals, our profession has been put under an undoubted disadvantage, and efforts are now being made with a view to having the Civil Code amended both in regard to the term of prescription for any accident that may occur within ten years and also with a view to separating the responsibility attached to architects from that of the contractors.

Efforts have also been made to foster and encourage mutual

intercourse, and with that end in view monthly meetings have been established, where discussions take place on subjects pertaining to our profession, and if the members would only realize the benefit that would accrue to them by taking part in these meetings, a better attendance would reward our efforts.

These meetings are bound to establish a friendly spirit of good will and toleration. Such a spirit is a necessity; without it our Association would be useless and but for it alone, our existence is justified.

Such is a very superficial resume of the work undertaken and accomplished during the past five and a half years. It is not all that might be desired by any means, but I have endeavored to look at the question from an unbiased point of view, and, while pointing out the good work that has been done, I am not in the least backward in acknowledging its imperfections and shortcomings.

We have been criticised on more than one occasion and on several counts. I do not question the right of any member to criticise the acts of the Association or the Council, for such criticism carried out along certain lines would result in much good. Constructional criticism is at all times beneficial, for it not only points out the evil but it comes forward with a remedy. Destructional criticism can be used to advantage, for if it does not point out the way to go, it at least shows up to disadvantage the way travelled, but what I object to is that system of criticism of the negative type that stands aloof and simply says that the Association has done nothing and that no good can be got out of it. These critics cannot evade their responsibility; they have no right to sit on the fence and arbitrarily say that we have done nothing, for if such be the case, then they are as much responsible as any member of Council, for it implies that they knew what to do under the circumstances but refrained from tendering their services. The Association at all times welcomes the member who is willing to take his share of the work, and the pity is, that there are so few who seem to realize their responsibility in the matter. The mere fact of having a Council does not remove this responsibility from the shoulders of the members, and the Council have at all times welcomed suggestions and well directed criticisms on the work.

To the criticisms that have been applied to the tariff, I have already referred, and to those who question the actions of the Association, with respect to illegal practice, I would remark, that it is not the first duty of the Association to prosecute such offenders. If such was the reason of our existence, I would heartily say "Perish the Association." It is necessary for every city to have its system of police, yet the mere necessity for having this protection is not the cause of its being. Police are necessary for the holding in check of law breakers, but the duty of the citizen is to keep the law and to foster and conserve its best interests, and so it is with our Association. Legal proceedings are an unfortunate necessity, but by no means of first importance, and in our zeal for the wellfare of our Association, we should not let this phase of the question blind us to our higher duty—to safeguard the public interests as pertaining to our work, to raise the dignity and standard of our profession and to foster that "Esprit de corps" without which our efforts would be abortive and valueless. Did we obtain the charter in order to prohibit certain individuals from practicing or to obtain a tariff satisfactory to all minds? If such was the idea of the founders, why was it not expressed? It was not expressed, simply because such matters were recognized as mere incidents. The organizers of the Association had a higher idea of their responsibility and in the fulfilment of that responsibility, they had to sink everything that appeared personal or mercenary. What does the preamble of the charter of the Association say? "Whereas it is deemed expedient for the protection of the public interests in the erection of public and private buildings—and to insure a standard of efficiency in the persons practicing the profession of Architecture." Analyze this clause and we find that the charter was granted, first, because it was deemed expedient for the protection of public interests; secondly, to establish a standard of efficiency, or in other words a recognition of the necessity for professional education; and thirdly, with the object of advancing the art of architecture. And again the Association was incorporated, according to the second clause of the preamble, for the object of the "acquirement and interchange of professional knowledge amongst its members, and more particularly the acquisition of that species of knowledge which shall promote the artistic, scientific and practical efficiency of the profession of architecture." In the face of such high and dignified ideals, does not the criticism of mere incidents seem trivial, and the laying of emphasis on such questions as tariff and legal proceedings, appear selfish and mercenary?

Do not misunderstand me—I do not say that we should not prosecute persons practicing illegally, or that we should not make a serious endeavor to amend our tariff, but I do say that such questions are not of the vital importance some would have us think, and, I am sometimes afraid, that in laying too great stress on these questions, we may lose sight of greater opportunities to do good, and in the effort to catch the shadow, lose hold altogether of the substance.

In my remarks on the work accomplished, I suggested the lines along which the future work lies. We cannot and must not remain stationary; we must go forward accepting our self imposed responsibilities with feelings of thankfulness and in the full realization of our duty; seize hold of the opportunity given us to advance the interests of our profession in this fair Dominion as a whole, and in the section known as the Province of Quebec in particular. But this can only be done by and with the help of every individual member of the Association. But how can this be done? By the fostering of that "Esprit de corps" which is a primary necessity, where persons are brought together to act collectively for a given purpose, and I think that you will all grant there is room for improvement in this respect.

This will hardly be disputed by anyone, on the general aspect of the question at any rate, although at the same time it is gratifying to acknowledge instances are by no means uncommon where we have received nothing but the most considerate treatment at the hands of our confreres. Yet we must admit that these instances are far too uncommon, and where it ought to be the rule it is more often the exception. It is not where we have direct intercourse with one another that the want of "Esprit de corps" is most felt, for then our self respect compels us to act so that our motives are not open to question, but it is on occasions where our actions may remain undiscovered; when nothing but brotherly consideration and common fairness should determine our course, and when the hope of personal advantage must be weighed in the balance against our duty to our confrere, it is then that we deplore the dearth of that spirit which ought to imbue the disciples of that world-old profession, which is our's by adoption. The want of brotherly feeling is in evidence on all hands. We see it in the petty jealousy which questions the public encomiums bestowed upon a confrere. We see it in the refusal to acknowledge any good work done unless it is done by ourselves. We see it in the willingness to accept work at any commission so long as we can prevent it entering another office, and we see it in the avidity with which we rush to throw our services at the feet of any one whom rumour credits with the intention to build. How can we expect sincere individual effort for the advancement of our profession and art under such circumstances? We are arrayed one against another instead of working hand in hand. Still I do not consider the solution a helpless one—far from it.

There are many reasons to which we can ascribe the present condition of affairs and without going into them all, may I touch on a few.

And the first is, that we are Colonists. Now I do not use this word in any depreciatory manner, but merely to describe the conditions and circumstances under which we undoubtedly labour. I mean by this, that we belong to a country comparatively in its infancy, whose population is composed of people gathered from the four winds of heaven or of descendants of those who only a generation or two ago, made this the land of their adoption. We have consequently not yet reached the period when our people shall be knit together by the kindly hands of time and when a common tradition shall obliterate our kaledioscopic origin. We may point to our profession in the countries of Europe, and lament the want of a similar "Esprit de corps" in our own midst, but that condition was not gained in a year, neither in one hundred and fifty years. The follower of of our profession in Europe can pride himself on the fact that he is walking, humbly it may be in the footsteps of the Masters, whose names and works are held in world-wide reverence. He is imbued with that spirit of tradition which deifies the most common-place object; while we may only look back a few years to the time when the Chief's wigwam was the Parthenon of the land, or to more recent times when the standard bearer of our profession went around with his T-square made plan in one hand and his kit of tools in the other.

Again, these are the days when the spirit of personal aggrandisement permeates every action. We will never return to the days when the personal gratification, engendered by love of our art, shall be considered full value for the labour expended. Who among us to-day would be willing to give our labour for the mere pittance often grudgingly given to the old masters? It is well to recognize the fact that the world is a very poor respecter of persons, and that the "survival of the fittest" is the gospel proclaimed day after day from the house tops. In this struggle for existence, we must not be surprised therefore, if, in some instances the corners of the finer qualities of mankind become ragged; but, recognizing the force of circumstances, let us stand shoulder to shoulder, giving mutual assistance and presenting a solid front to the varied influences that in many ways threaten the very foundation of our profession.

As a remedy for the present condition of affairs, time alone will be the great antidote.

True, much can be hoped from some of the influences which can be brought into play if we only take advantage of them. One I would mention is, such schools as McGill, where, under the influences of the broadmindedness of its professors, a band of young men is being trained up under the same masters, under the same influences and in the same professional atmosphere, and, it is but natural to expect that when they take their place in the ranks of practicing architects, that their treatment towards one another and to their profession, shall be governed by that brotherly spirit which at all times is to be found amongst students having a common Alma Mater.

The second, is that power which is lying dormant in our Association, and it lies dormant purely through the indifference of the individual members.

If this Association will only use its inherent power to establish a proper "Esprit de corps" among the members, it will have justified the fact of its being. That it has the power to do so is apparent to those who are accustomed to meet here though solely on business matters. But as an Association merely, we will be powerless; it requires the assistance of every individual member, who should, in the full realization of the noble profession to which he belongs and which contains on its roll, names that stand out as beacon lights, illuminating the surrounding darkness of doubt and superstition, sink every feeling that does not redound to the glory and advancement of our profession.

BY THE WAY.

The selfishness of human nature has been exemplified by many Baltimore property owners who, taking auvantage of the demand for accommodation created by the recent fire, have raised rents to double and treble what they were formerly receiving. Short term tenants were given the alternative of paying the exorbitant rates or finding new quarters.

* * *

The difference between a municipal official who is alive to his duties and one who looks upon his position as a sinecure, is well illustrated by the results of a recent change of superintendents of buildings for the Borough of Manhattan. The new superintendent reports :—"When I assumed office there were pending, exclusive of fire escapes and unsafe building cases, over 4,000 violations. During the present quarter, 2,167 new cases have been filed, 5,237 cases have been dismissed, and 757 cases sent to the corporation counsel for prosecution, leaving pending in this office 605 violations, 500 fire cases, and 735 unsafe building cases. Cases in which the time given by the building code to the owner to comply with the law has not yet expired, and they constitute the ordinary current business of this bureau, which is receiving our daily attention."

* * *

A case was heard before Mr. Justice Gibson recently in which Robert J. Dalzell sued Miss Florence O'Mahony to recover 140l. 16s. 9., balance due for work done and materials supplied to her for building purposes. The plaintiff is a merchant residing at Killorgin, County Kerry, and the defendant resides at Beaufort, near Killarney. She by her defence denied liability, and counter claimed for 63l., and pleaded that the balance had been fully discharged, but lodged 51l. in court. It appeared that the defendant was her own contractor and clerk of works, and that she had obtained part of the materials for the building of her house from the defendant. He advised her against using a certain description of slate for the roof, but she disregarded his advice and followed her own will, and when it turned out a failure in the hands of slaters not used to it, she shifted the blame on the plaintiff. She had the house reslated, and, then counter claimed for the cost, 63l. A large quantity of the correspondence which had passed between the parties was read, among which was a post card which the defendant addressed to the plaintiff, which was in the following terms: "Deluge recommenced; mastic cement not had time evidently to harden before the rain came, and the last rain has made it as soft as putty, and is calmly soaking through. I foresee we shall spend the winter in macintoshes, come down to breakfast under umbrellas, and keep a lifeboat attached to the pump instead of a fire hose. I shall expect you to supply all the above gratis."

Mr. Justice Gibson found for the plaintiff for 124l. 17s. 9d., and allowed the defendant 10l. on her counter claim—The Architect.

Mr. John Clare, of the firm of Clare Bros. & Co., Preston, Ont., died suddenly on the 21st inst. from a stroke of appoplexy. Mr. Clare, who was 56 years of age, was very highly esteemed in the community where he lived.

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NOTES.

In a recent lecture on geology in Glasgow, Mr. A. McWilliam, A.R.S.M., stated that granite consisted mainly of two minerals, quartz (hardness proportionately 6) and felspar (hardness 7), whilst the hardness of a best-quality Sheffield pocket-knife blade was 6½. The wearing powers of granite would therefore be readily understood. Pure clay with less than about 2 per cent. of potash and soda was a fireclay; if white, a china clay or a pipeclay; while containing 5 per cent. of oxides of iron and generally a fair amount of potash and soda it became an ordinary red brick clay.

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It is claimed that this system is an improvement on the inventions of Monnier, Hennebique, Koener, and others. It consists in manufacturing, in a factory, the mortar into hollow beams for forming a floor or roof ready for delivery to the builder—one which can be laid together on the supporting walls without planking. By this means one floor after another can be laid in a very short time, and the floor so laid can be used to work upon at once without scaffolding.

This appears to me as a great advantage compared to the usual devices of stone, plaster, etc., which are dependent largely upon temperature and weather, and in all cases must be left for some days to dry before they can be walked upon.

One advantage claimed for the Siegwart system is that no workmen are required other than the ordinary laborers. Another fact which should be considered is that armored beams which are made in the building can only be depended upon for uniformity when the mortar is mixed in exactly the same proportions and when it is not influenced by shocks, frost, or rain during the time of setting. When this is done in the factory it is far easier to secure uniformity and protect the beams against weather conditions.

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laid parallel with the under border of the beam, and the other four are bent upward into the form of a knot at the ends in order to strengthen their holding power. The proportion of cement with coarse sand is 1 to 4. Though the beams are made hollow, they have the same supporting power as though they were solid, with a great reduction of weight. This is an important factor where freight charges are to be considered. The beams, being hollow, offer also more favorable conditions for heating. The sides are ridged, so that the cement for joining them together can enter into the vacant spaces and thus form a solid mass. The laying together of the beams is done exactly as with wooden beams.

The beams are supplied in different lengths. In Lucerne they are made up to 5.5 meters (18 feet) long; in Italy and Germany, up to 6.5 meters (21.3 feet) long; and in Russia, up to 7.5 meters (24.6 feet) long. They can be used, in addition to floors, for terraces, roofs, staircase supports, and for walls where there is side pressure, as, for instance, in coal bunkers, warehouses, etc. It has been demonstrated that with a load from four to five times as great as the normal the beams have only bent to the extent of 1 or 2 milimeters (0.0394 and 0.0788 inch). The chief advantages claimed for these beams are: Great supporting power and security from fire; they come dry and hard from the factory and can, therefore, be used at once as floors for working on; greater facility and speed in building is secured by their use; freedom from excess of heat and cold by reason of their being hollow; thickness of completed floors is reduced by their use; the beams can be used as a heating floor by sending warm air through them.

The manufacture of the beams as practiced in the Siegwart Beam Factory in Lucerne, Switzerland, and in other European countries is very simple. They are manufactured in layers of 2.5 meters (8 feet) breadth and not singly. The hollow spaces are formed by means of iron molds, around which the cement is laid and the iron rods placed in position. These iron molds are constructed so that they can be reduced in size by the turning of a screw and withdrawn when the cement has become hard. The beams are cut, before the cement has set, by means of a patent cutting machine, which can be placed in any position. Six to eight hours after laying the beams the iron molds can be withdrawn, but they are generally lett to harden for four to six days before they are separated. After two to three weeks they are ready for delivery.

There are already a large number of buildings, both public and private, in Switzerland in which the Seigwart beams have been employed, and in all the buildings now in course of construction in Lucerne they are being used. At present there are three factories in Germany, three in Russia and one in Italy occupied in manfacturing beams under the Siegwart patent.

MECHANICS' LIEN LAW.

At the recent session of the Legislature of British Columbia the addition of a number of sections relating to costs was made to the Mechanics' Lien Act of that province. The limit of fees in money or stamps payable to any judge or officer in any action brought to realize a lien is placed at $1 on every $100 of the claim up to $1,000, and this is only payable by persons other than wage-earners. The costs to the plaintiff in any action must not exceed 25 per cent. of the amount of judgment, besides actual disbursements. Where the costs are awarded against the plaintiff such costs must not exceed 25 per cent. of the claim of the plaintiff besides actual disbursements. Where the less expensive course is not taken by a plaintiff the costs allowed to the solicitor must in no case exceed what would have been incurred had the least expensive course been taken. To the costs of discharging or vacating a lien a reasonable amount of costs for drawing and registering a lien may be allowed, in addition to the costs of an action. Costs not otherwise provided for are left to the discretion of the judge or officer to whom application is made.

PERSONAL.

Mr. J. A. Pearson, architect, of Toronto, has recently returned from a visit to Europe.

Mr. A. J. Rattray has recently commenced architectural practice in Toronto, his office being in the Canada Permanent Building.

NOTES.

A striking feature of the new cathedral at Liverpool, England, will be the height of the vaulting of the nave and choir. Measured in the barrel vaulting it will be 116 feet, and in the high transepts 140 feet. No cathedral in the country approaches its height. The nearest is Westminster, the nave of which has a height of 102 feet, while York measures 99 feet; then Salisbury 84 and Lincoln 82. Chester reaches only 78. The "whispering gallery" of St Paul's Cathedral is 100 feet from the floor.

Incombustible paint for woodwork is prepared by mixing together in a fine powder 20 per cent. pulverized glass, 20 per cent. porcelain, 20 per cent. stone (silicious), 20 per cent. calcium lime. Then mix these compounds with 30 per cent. of silicate of soda. The lime gives unctuosity to the mixture, and by partially combining with the soluble glass, makes a more intimate mixture. Other proportions of the several ingredients can be used, but the percentage of silicate of soda and lime should remain as above. The mixture is applied to the surface in the same manner as ordinary paint. The first coat sets immediately, and the second may be given from six to twelve hours afterwards. Two coats are usually sufficient.

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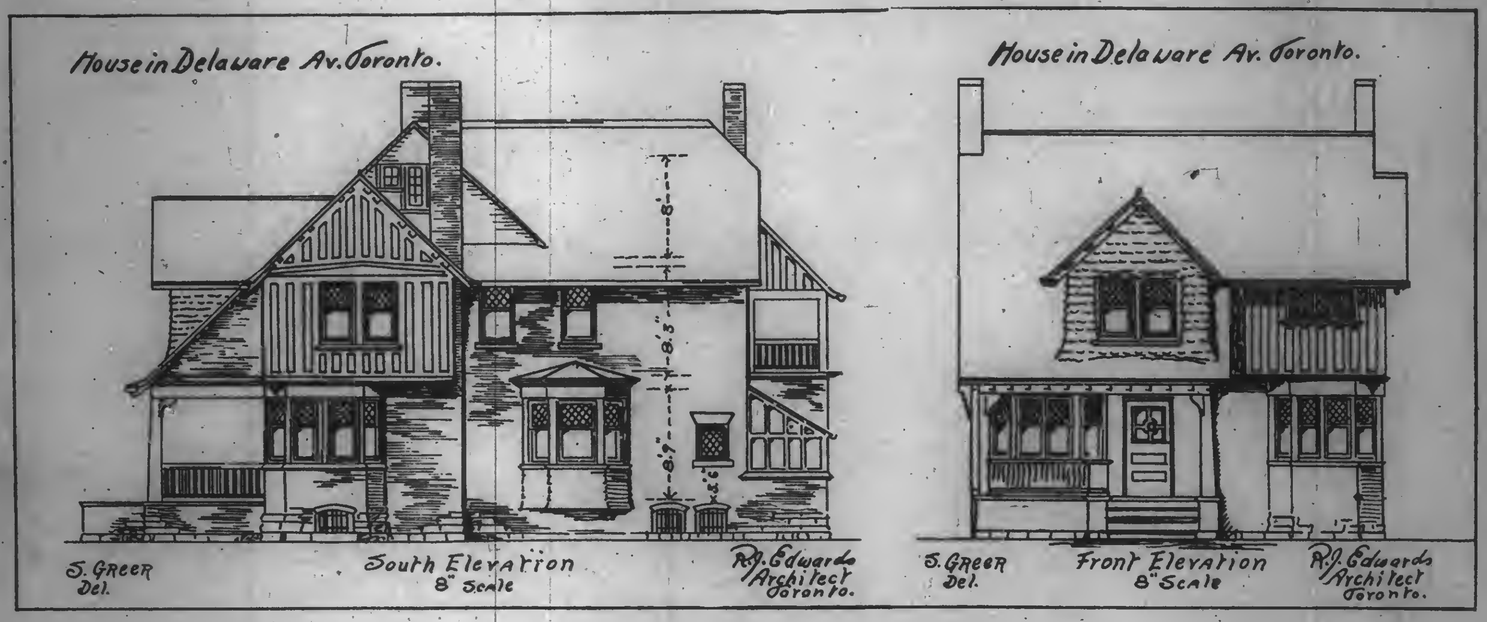
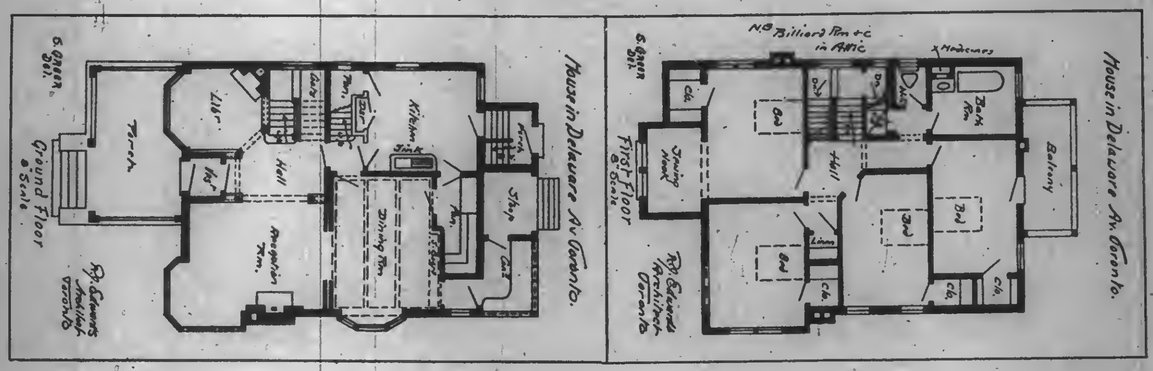
SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
APRIL, 1904



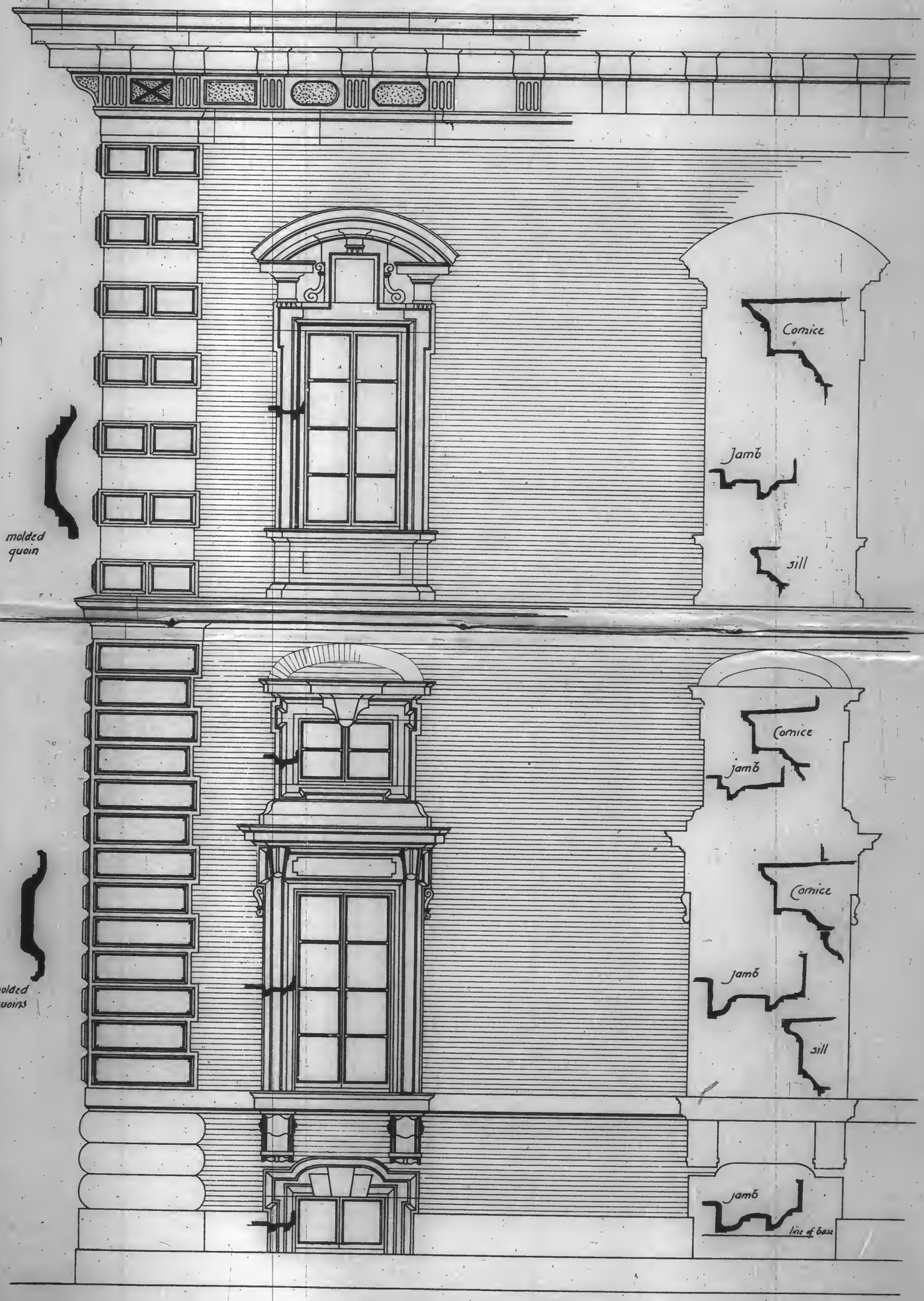


HOUSE IN DELAWARE AVENUE, TORONTO—R. J. EDWARDS, ARCHITECT

SUPPLEMENT TO CANADIAN ARCHITECT AND BUILDER APRIL, 1904

PALAZZO DI BRERA : MILAN:

PORTION OF MAIN FACADE



PORTION OF MAIN FACADE, PALAZZO DI BRERA, MILAN.

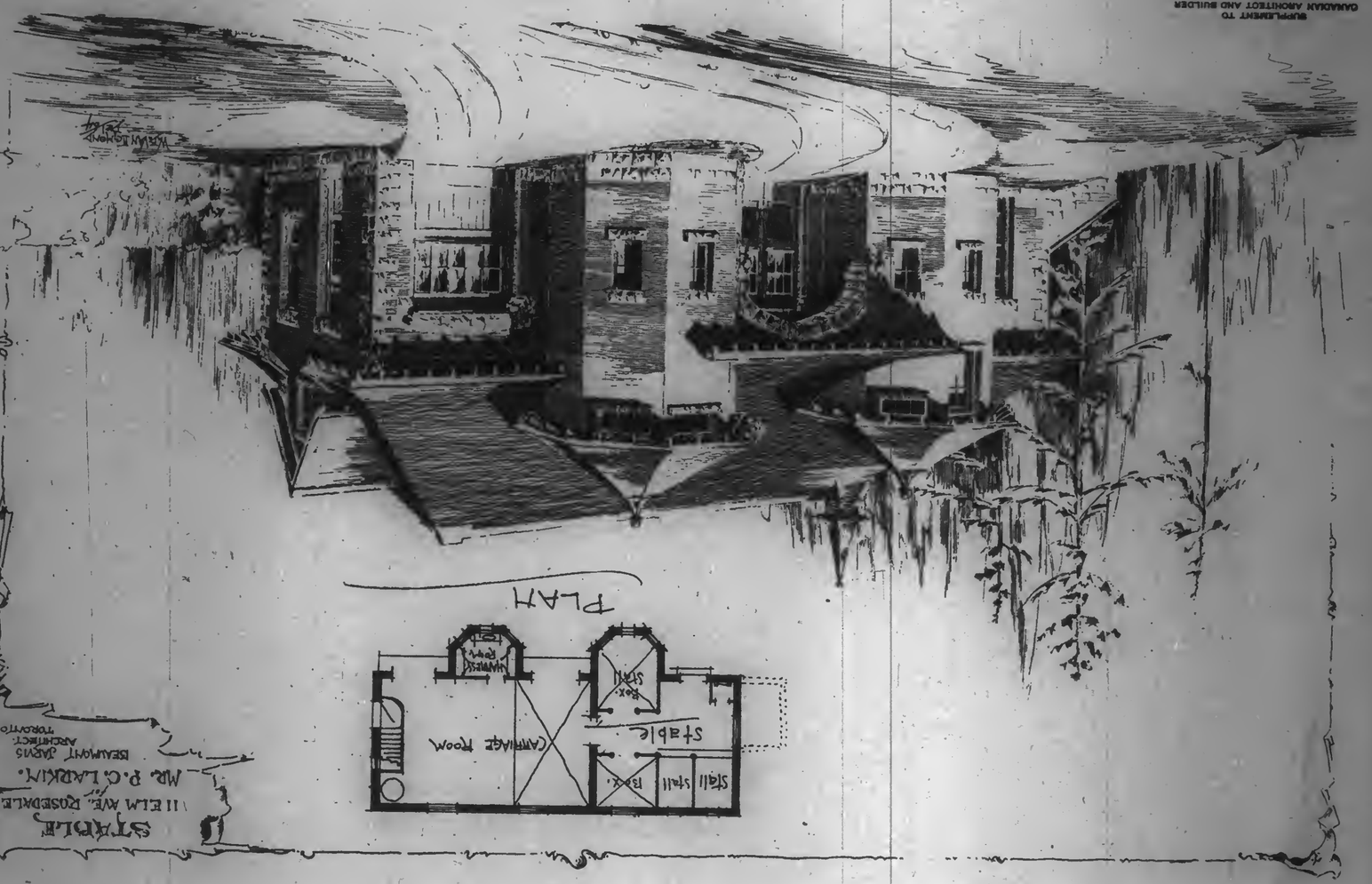
MEASURED AND DRAWN BY MR. CECIL BURGESS.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
APRIL, 1904

BANK OF BRITISH NORTH AMERICA, TORONTO
BURKE & HORWOOD, ARCHITECTS

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
APRIL, 1904

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
APRIL, 1904



The Canadian Architect and Builder

VOL. XVII.—No. 197. MAY, 1904.

ILLUSTRATIONS ON SHEETS.

Competitive Design for Golf Club House.—Geo. W. Gouinlock, Architect.
Old Scotch Chair in a Glasgow Painter's Studio.
House in Brunswick Avenue, Toronto.—Bond & Smith, Architects.
Durham Castle Staircase.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Sketches of Old Buildings in Montreal by "Gargoyle" and Mr. Cecil Burgess.

ILLUSTRATIONS IN TEXT.

Views of Recent Toronto Fire.
Portraits of Officers of Winnipeg Builders' Exchange.

CONTENTS

Editorial	81-82	Architects' Fees	89
Ancient Lights	83	Mural Decoration	90-91-92
New Building Regulations for Toronto	84-93	Notes from Quebec	93
Personal	85	Montreal Letter	95-96
Winnipeg Builders' Exchange	86	The "Elkay" Bathroom	ix
The Toronto Fire	87	Crystal Booth at the St. Louis Exposition	x
What Constitutes Beauty in Architecture	88	The Ontario Association of Architects	xi
Lighting of a House and its Effect Upon the Decorations	89	Report on the Baltimore Fire	xii

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" A. F. DUNLOP, R.C.A., Architect, Montreal.
" FRED. T. HODGSON, Architect, Collingwood, Ont.

OUR WINNIPEG OFFICE.

The publishers of this journal have recently opened a branch office at No. 310 McIntyre Block, Winnipeg. A resident representative has been appointed who will be exclusively employed in advancing the circulation of this journal and in keeping our readers informed regarding the latest developments throughout the west. The kind co-operation of our friends in the west is solicited in behalf of the success of this enterprise.

Publication Deferred. The demands of other matter upon our space compels us to defer to a future issue publication of a number of specially prepared articles on cement construction intended for this number.

Workmen's Compensation Act. The variety of interpretations put upon the British Workmen's Compensation Act is such that contractors are kept in a state of constant anxiety and uncertainty with regard to their liability under the Act for damages to workmen. One of the latest decisions awards damages to a workman upon whom a wall fell while engaged in eating his lunch. The fact that usually this workman went home for his lunch, and that had he followed his usual practice he could not have been said to have been injured while engaged in his usual employment, seems to have had no weight with the court.

War and Linseed Oil. A curious illustration of the many unexpected influences which may affect the prices of commodities in everyday use, is afforded by the present war between Russia and Japan. As is well known in consequence of this war the price of wheat has advanced to the highest point reached in many years. This has led to an increase in the area sown to wheat and a decrease in the area sown to flax. In the Dakotas the reduction in the flax acreage is placed at 50 per cent. As a result linseed oil, the product of flax, and the basic material of all good paint, seems destined to be high in price. This in turn will aggravate the evil of paint adulteration. with which everybody wanting to secure a good and lasting quality of work has had to contend for some years past.

Protection of Workmen. When last year the City Council of Toronto, at the instance of the labor unions, passed an amendment to the building by-laws compelling contractors to lay down temporary floors at every storey of buildings under construction, the new regulation was regarded by architects and contractors as a hardship, involving unnecessary expense and trouble. Its necessity was, however, shown by the death of a workman in Montreal the other day, who in attempting to cross from one side of a building to the other stepped on the end of a plank

which tipped, precipitating him to the ground from a height of five stories. If temporary floors had been laid down as required by the Toronto building by-law, this man's life would have been spared, and his wife and family of five young children would not have been deprived of the bread-winner. Workmen have a right to insist that every reasonable precaution be taken for their safety. The cost of necessary safeguards for this purpose should be included in contractors' estimates.

Timber Tests. A plea is made by the Engineering-Record for a continuation of the timber tests conducted some time ago under the direction of Prof. Fernow of the Forestry Department at Washington. It is very properly urged that future tests, to be of practical value to architects, engineers and builders, should deal with timber as it must be purchased from the dealer, not with selected specimens, from which much better results will be secured. On this point our contemporary says:—While engineers already possess a large amount of experimental data in regard to the resistance and durability of timber a far larger amount of information than yet secured is most urgently needed, not only as to the ultimate resistance under different kinds of stress but also a much more complete knowledge of the conditions under which greater durability may be secured. The resisting value of the details of framing, the effect of preservative processes on both elastic and ultimate resistance and a great variety of other similar data are also still lacking.

Cement Tests. With the rapidly increasing use of cement in construction work, the time has come when a systematic system of testing cement should be established. It is quite as much to the interest of cement manufacturers and dealers as to the interest of owners, architects and builders that all cement should be subjected to test. If this plan is not followed, we may expect to see failures in cement construction which will tend to weaken confidence in the material and greatly restrict its use. That there is a great deal of cement of poor quality on the market is a well known fact, and steps should be taken to prevent this material from getting into works of construction. A Canadian manufacturer of cement submitted a sample of his material to one of the Canadian scientific schools recently, and it failed to stand the hot test. If such was the result with a cement that may be supposed to have been specially selected for testing purposes, there is every reason to suppose that much of the cement bought and sold in the ordinary course of business is far below the proper standard of quality. In what way the testing of the material should be carried out is not quite clear. It has been suggested that the Government might inspect the material at the mills, as is done in Germany, but Governments are slow to act, and the adoption of a system might be indefinitely postponed if the Government were depended on to undertake the work. Perhaps a better plan would be for each city and town to adopt a regulation compelling all cement used within the municipality to be subjected to test. It is to be hoped that action will be taken in this direction at once, in order, as stated, that the development which cement construction is now having, may not be retarded.

Building in the North West. Probably nowhere on this Continent is there to be found greater activity in building operations than may be witnessed at present in the city of Winnipeg. Population is flowing into this city at such a rate that it is found impossible to build rapidly enough to meet the requirements for houses and buildings for business purposes. The value of new buildings erected last year was in the neighborhood of $6,000,000. This year the figures will probably reach $10,000,000. The population increased last year by 13,000, and will probably show a greater increase this year. The city directory shows a present population of 70,000. As a result of the demand for buildings, the number of architects and builders is rapidly increasing. There are at present about thirty practising architects in the city. Several eastern firms have recently opened branch offices. Building materials of every kind and skilled mechanics are in urgent demand. Fears are expressed lest the recent great fire in Toronto should interfere with the supply of materials and workmen required for this season's operations.

It is a fortunate thing for the city that, at the outset of its career several of the leading banks have erected on the principal business thoroughfare buildings which, in point of architectural beauty and substantiality, would do credit to any city. These buildings will serve as good examples for those to come after them, and will be likely to prevent the putting up of uninteresting and ugly buildings. Unfortunately, it has not been possible in the past to obtain red bricks at reasonable cost. Those manufactured in the immediate vicinity are grey and, while substantial in quality, give to the buildings an uninteresting effect. In such a bright clear atmosphere and a climate which in winter is sometimes severely cold, the use of warmer tints of color is desirable. The Dominion Bank, built of red sandstone from Lake Superior, has a very pleasing appearance, and should lead to the use of this stone in important buildings in the future. In view of the high price of stone and brick, it is probable that cement construction will become popular when a good quality of cement shall be manufactured in the Northwest. At present the material must be imported at a cost of $5.00 per barrel, which prohibits its use on a large scale.

There are many differences to be observed in methods of construction employed in the Northwest, as compared with those in the East. The severity of the climate in winter makes it necessary to give the occupants of buildings greater protection against the cold. Hollow walls and box construction for windows are prominent features. Houses are built as far as possible without projecting features, chimneys being kept inside the walls in order that as much heat as possible may be retained within the building. It has been found that a thin hollow wall is of greater service as a protection against cold than a solid wall however thick. As during the period of frost there is little or no rain, no coping is required for brick walls and chimneys, and the exterior of buildings is not subject to disintegration by alternate thawing and freezing, as in a milder climate.

ANCIENT LIGHTS.

The House of Lords has delivered an important judgment, on the question of ancient lights, which definitely settles the basis of equitable adjustment of the opposing interests, in this respect, of the owners of old buildings, and the promoters of new ones; not only in England but throughout the Empire, where the House of Lords is the final Court of Appeal.

The case was one of injury done to a tenement on one side of a street by adding to the height of the tenement opposite. The complaint was that a room on the ground floor of the complainant's (or plaintiff's) tenement was perceptibly darkened by the height added to the tenement of the defendant.

The darkening was a matter of fact which does not appear to have been disputable. On the other hand there were qualifying circumstances which excite sympathy with the defendant:—That the room which was darkened ran through to the back of the building and had no window at the back; so that it was dark in any case, and for many purposes would have always required artificial light at the back:—that the defendant's building, even when added to, was lower than that of the plaintiff. These circumstances, which to an ordinary onlooker seem to exhibit the plaintiff rather than the defendant as the oppressor, serve to show as the case, before coming to the Lords, had gone against the defendant in the Court of Appeal—how decidedly the Statute has been interpreted on the side of the non-disturbance of existing rights.

The Statute, commonly called the Prescription Act, gave a prescriptive right to light which had been enjoyed for a period of 20 years. The interpretation put upon this by the Courts has apparently been, that, if a building has received a certain amount of light for 20 years, the owner is entitled to claim that same amount of light for ever. According to the Times, this stiff interpretation has given rise to an attitude on the part of building owners that has grown from the merely self-defensive to the extortionate. The moment a building is pulled down, to make way for a larger one, the neighbouring owners placard their windows as "ancient lights"; in most cases with no other intention than to extort payment under threat of a lawsuit. They no doubt believe that they have a proprietary right to their light, which must be bought if it is to be interfered with. The effect, at any rate, has been an embarrassment of building improvement about which there has been much complaint by architects.

The history of the present case was that in its first trial (Dec. 20, 1900) the Judge found that the action failed because the plaintiff's premises would still, in his opinion, "be well and sufficiently lighted for all ordinary purposes of occupancy as a place of business." The Court of Appeal, (Dec. 20, 1901) reversed this decision on the ground that, according to the law of England, the owner of the ancient light is entitled to the whole amount of light which has ever reached his windows. The appeal was twice argued before the House of Lords—in May and in December of 1903, judgment was delivered on May 2 last.

The Lord Chancellor pointed out, in his judgment that, if the principle laid down by the Court of Appeal were to be applied consistently, towns would not grow; because any dweller on the edge of a town, who had for 20 years enjoyed free access of air without buildings near him, would be in a position to restrain any interruption of this enjoyment by the extension of buildings beyond him. Indeed under this principle, no vacant piece of ground could be built on in the city; and the rights of people to utilize their own land would be formidably restricted. The right of access to light not being a proprietary right in the light itself but only a right to its enjoyment which is common to all, he concludes that the test of the right is whether the obstruction complained of is a nuisance. That is to say, a dweller in towns cannot expect to enjoy absolute daylight any more than he enjoys as pure air, as much freedom from smoke and smell, or as little disturbance from noise, as if he lived in the country; yet as an excess of smoke, smell or noise may give a cause of action so it is in the question of deprivation of light—the question is one of degree. And the test of right must further have some elasticity that it may fit the surroundings and circumstances of each case, since these affect the amount of light required.

The Lord Chancellor having thus, by the investigation of elementary principles, endeavoured to get over what he calls "the danger of attempting to put a principle of law into the iron framework of a statute," the four other judges gave judgments to the same effect, with such further considerations as show the conclusion of the whole matter to be that a 20 year user of light acquires no prescriptive right beyond such consideration as one would think would be given by common law without the intervention of a statute; for the owner of a building of any age is declared to have no more than an equal right with the owner of the newest building near him to an amount of light, "sufficient according to the ordinary notions of mankind, for the comfortable use and enjoyment of that house as a dwelling house, or for the beneficial use and occupation of the house if it were warehouse, shop or other place of business." The owner of a new building, built on a lot previously vacant can of course only get a share of what light is going, but he is entitled to that; and nobody else seems to be entitled to any more. If there is less light going after the advent of the new building, the owner of a 20 years old building opposite must be content with the change so long as his building "retains its substantial identity." It seems therefore that an exceptional need for light in an old building cannot claim full consideration. This would be to uphold the right to an average MAXIMUM of the light that had been shed on the windows in the past; and this view, which was that of the Court of Appeal, the Lords reject. It is unfortunate for definiteness of decision in the matter that Lord Davey, who alone considers this aspect of the question in a concrete way, gives, in illustration, suppositional cases of one class only, viz., of premises converted from a purpose requiring less light to one requiring more; and he says that a man, in thus calling upon his neighbor to leave him a supply of light which is rendered necessary only by such alterations, imposes an increased burden upon his neighbor, which no man can do by any act of his own. This seems to limit indefensible claims for extraordinary amount of light to those which are made on behalf of a building which has altered its substantial identity so as to require more light. But he can hardly intend this limitation for he introduces his illustrations in the middle of an argument which, accepting

what he says "is agreed on all hands", that a man does not lose or restrict his right to light by not using the full measure of light that the law permits, asks :—"If the actual user is not the test where the use falls below the standard of what may reasonably be required for the ordinary uses of inhabitancy and business, why (it may be asked) should it be made a test where the use has been of a special or extraordinary character in excess of that standard." And he concludes that the only test of right is a fair standard which, under the title of a "supposed standard," is more than once alluded to in these judgments as having been objected to in a former case by one of the judges of the Court of Appeal whose decision in this case these judgements reverse. Lord Davey's final statement seems to be definite enough :—"I am of opinion," he sums up, "that the owner or occupier of the dominant tenement is entitled to the uninterrupted access through his ancient windows of a quantity of light, the measure of which is what is required for the ordinary purposes of inhabitancy or business of the tenement according to the ordinary notions of mankind, and that the question for what purpose he has thought fit to use that light, or the mode in which he finds it convenient to arrange the internal structure of his tenement does not affect the question. The actual user will neither increase nor diminish the right. The single question in these cases is still what it was in the days of Lord Hardwicke and Lord Eldon (whose decisions were given before the Prescription Act), "whether the obstruction complained of is a nuisance. I do not myself think that this rule is difficult of application in practice." In support of this latter statement which, as applicable everywhere, may perhaps be thought a strong one, his lordship adds :—"The experience of surveyors who are practically conversant with this matter is entitled to great respect ;" and also :—"The rule of 45 degrees is not, of course, a rule of law, and is not applicable in every case. But I agree with Lord Selbourne, 'City of London Brewery Company v. Tennant,' that it may properly be used as PRIMA FACIE evidence."

W. A. LANGTON.

MOISTURE IN WOOD.

According to M. Deploy, green wood when cut down contains about 45 per cent. of its weight of moisture. In the forests of Central Europe wood cut down in the winter holds at the end of the following summer more than 40 per cent. of water. Wood kept for several years in a dry place retains from 15 to 20 per cent. of water. Wood that has been thoroughly dessicated will, when exposed to air under ordinary circumstances, absorb 5 per cent. of water in the first three days, and will continue to absorb it until it reaches from 14 to 16 per cent. as a normal standard. The amount fluctuates above and below this standard, according to the state of the atmosphere. M. Violette found that by exposing green wood to a temperature of 212 deg. Fahr. it lost 45 per cent. of its weight, which accords with observations of M. Deploy. He further found that by exposing small prisms of wood ½ in. square and 8 in. long, cut out of billets that had been stored for two years to the action of superheated steam for two hours, they lost from 15 to 45 per cent. of their weight, according to the temperature of the steam which varied from 275 deg. Fahr. to 437 deg. Fahr. (125 deg. Centigrade to 225 deg. Centigrade).

NEW BUILDING REGULATIONS FOR TORONTO.

The City Council of Toronto will shortly take up consideration of a new set of regulations to govern the construction of buildings in that city. Meanwhile at the request of the City Architect, the Council have authorized the following amendments to the existing regulations, in order that the replacing of buildings destroyed by the recent fire may be proceeded with :—

Section 46 of the said By-law is repealed and the following inserted in lieu thereof :

"46. No building shall be erected or placed on old or new foundations, or on foundations partly new and partly old, unless the same shall be built with main walls of the thickness called for in the following tables, said walls to also comply with the other conditions as to heights and openings as hereafter specified.

WALLS FOR BUILDINGS USED AS A DWELLING HOUSE, APARTMENT HOUSE, TENEMENT HOUSE OR LODGING HOUSE.

Number of Storeys	Thickness of Walls in Inches.												
	Foundation Walls.		Ground Floor.	First Floor.	Second Floor.	Third Floor.	Fourth Floor	Fifth Floor.	Sixth Floor.	Seventh Floor.	Eighth Floor.	Ninth Floor.
	Stone	Brick.										
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
One storey	16	14	9									
Two "	16	14	9	9								
Three "	20	18	14	14	9							
Four "	22	18	18	14	14	9						
Five "	24	22	18	18	14	14	9					
Six "	27	22	18	18	18	14	14	9				
Seven "	30	27	22	18	18	18	14	14	9			
Eight "	30	27	22	22	18	18	18	14	14	9		
Nine "	33	31	27	22	22	18	18	18	14	14	9	
Ten "	36	31	27	22	22	22	18	18	18	14	14	9

WALLS FOR BUILDINGS USED AS HOTELS, OFFICE BUILDINGS, WAREHOUSES, FACTORY BUILDINGS AND PUBLIC BUILDINGS.

	Foundation Walls.		Ground Floor.	First Floor.	Second Floor.	Third Floor.	Fourth Floor.	Fifth Floor.	Sixth Floor.	Seventh Floor.	Eighth Floor.	Ninth Floor.
	Stone.	Brick.										
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
One storey	18	14	14									
Two "	20	18	14	14								
Three "	22	18	18	14	14							
Four "	24	22	18	18	14	14						
Five "	27	22	22	18	18	14	14					
Six "	30	27	22	22	18	18	14	14				
Seven "	33	31	27	22	22	18	18	14	14			
Eight "	36	31	27	27	22	22	18	18	14	14		
Nine "	36	36	31	27	27	22	22	18	18	14	14	
Ten "	40	36	31	27	27	27	22	22	18	18	14	14

In the foregoing tables of thicknesses of walls the perpendicular distance from the top of joists in one storey to the corresponding point in the next storey is to be understood to mean not more than 12 feet in the basement or cellar, 19 feet for the ground floor, 16 feet for the first storey, and 15 feet each for all storeys above the first, except the top storey, which may have an additional five feet in height at the highest point. If any storey exceeds these respective heights the walls of such storey and all the storeys below the same shall be increased one-half brick, or about four and one-half inches more than the thickness given in the tables, and if basement or cellar walls exceed twelve feet in height they shall, if built with stone, be increased six inches in thickness, and if of brick four and one-half inches in thickness for every additional ten feet or part thereof, in excess of twelve feet.

All cellar or basement walls built of stone or brick shall be laid in cement mortar. If solid buttresses or iron or steel pillars not over 18 feet between centres, with sufficient strength to carry trusses or girders, are used, then the thickness of the walls may be reduced one-half brick, or about 4½ inches, provided, however, that no brick walls shall be less than fourteen inches in thickness in any hotel, office building, warehouse, factory or public building.

The thickness of walls specified herein and set forth in the tables for the various buildings are intended to apply to all exterior enclosing walls, and all such interior walls as may be required for the support of floors and roofs.

An increase of one-half brick or about 4½ inches in the thickness of walls shall be made in all cases where the walls support trussed roofs, and are over seventy-five feet long, and where walls for warehouses and factory buildings are over one hundred and fifty feet long, without masonry cross walls of equal height.

All non-bearing walls of buildings may be four and one-half inches less in thickness than called for in the tables, provided, however, that none are less than nine inches or one brick thick.

The outside walls, if of brick work, of all public halls, theatres, opera houses or other buildings in which the roofs or ceilings are carried on trusses or girders of a span of fifty feet or more, shall not be of less thickness from the bottom of the first or ground floor joists at the lowest point in the main auditorium to the underside of the trusses or girders than the following :

(1) If the walls are over twelve and not over twenty-five feet high, they are to be not less than eighteen inches thick.

(2) It more than twenty-five feet high and not more than fifty feet high, they are to be not less than twenty-two inches thick for the first twenty-five feet, and eighteen inches thick for the remainder of the height.

(3) If more than fifty feet high and not more than seventy-five feet high, they shall be not less than twenty-seven inches thick for the first twenty-five feet in height, twenty-two inches thick for the second twenty-five feet, and eighteen inches thick for the remainder of the height. For any increase in height over seventy-five feet, the thickness of walls shall be increased in the above ratio. An increase of four and one-half inches in thickness of wall shall be made in all cases where walls are over one hundred feet long without cross walls of equal height.

(4) In case there shall be one or more storeys built above a public hall, theatre, or opera house, such storeys being carried on trusses or girders, the thickness of walls shall be increased by four and one-half inches, or one-half brick for each two storeys or part thereof above every such room.

(5) If solid masonry buttresses are employed and placed sixteen feet or less apart, and extended to the foot of the trusses or girders, carrying the ceiling and roof, or if iron or steel pillar are inserted in such walls for the support of the superstructure, and at distances not more than eighteen feet between centres, such pillars extending to and carrying the super-imposed trusses and girders, the thickness of such walls may be reduced in proportion to the increase or strength afforded by such buttresses or pillars ; but in no case shall any such wall be less than fourteen inches thick in the top storey, four and one-half inches or one-half brick being added going downward for each storeys or for each gallery, or for each twenty-five feet in height of blank wall. If iron or steel pillars are introduced in said walls, the brick work around the same shall be bonded into that of the connecting walls, and each of such pillars shall have not less than nine inches of brick wall around it, the brick being measured from the extreme outer dimension of such iron or stee pillars.

(6) If a public hall, theatre, or opera house is of skeleton construction, and the steel framework carries the entire super imposed load of floors, roof and walls, then the enclosing walls shall consist of fourteen inches of solid brick work, with two inches of hollow tile, or four inches of hollow brick on the inside, properly bonded together, the balance of the structural parts to be protected against the effects of fire,

All walls given in the tables shall be increased in thickness or be reinforced with equivalent pilasters or buttresses when the following are the conditions :

When walls are more than twenty-five feet apart, one-half brick shall be added for every succeeding interval of twelve and one-half feet, or part thereof, of distance between them without intermediate division walls or rows of column and girder supports.

When any horizontal section section of walls shows more than twenty-five per cent. reduction of area on account of flues, openings or recesses, one-half brick shall be added for every succeeding interval of ten per cent. or part thereof reduction, provided that in walls of uniform thicknesses such reduction does not exceed fifty-five per cent. of the whole, or in masonry pier construction not more than seventy per cent. for each bay.

Wherever walls less than eighteen inches in thickness are utilized for the support of ordinary joists in buildings used for the sale, storage, or manufacture of merchandise, or public livery, boarding or in sale stables ledges four inches wide shall be corbelled out in not less than four courses, of brick for the support of such joists, and in buildings of all classes where furring strips, whether combustible or incombustible, are used on bricks walls, there shall be ledges equal to the thickness of such furring strips upon such walls, and in all cases where such ledges are built, they are to be commenced at the bottom of the joists, and are to be carried up to and levelled off at a line at least one inch above the top of the joists.

All wooden joists, beams or other timbers in the party wall of every building built of stone or brick or other incombustible material, shall be separated from the joist beam or timber entering the opposite side of the wall by at least four inches of mason work.

TIMBER IN WALLS PROHIBITED.

No timber except inside lintels, as hereinafter provided, brace-blocks, or wood brick, not more than nine inches in length, shall be used in any wall of any building where stone, brick or iron is commonly used. And the roofing in Limit "A" shall be of incombustible material. All brick walls shall be carried up on the construction aforesaid to the underside of the roof boards, whether front, rear, party or gable walls ; and all gable or parapet walls surmounting roofs of mercantile buildings shall be at least one brick and a half, or fourteen inches in thickness, and shall be carried to the full height of three feet above the roof, on a square line therewith. All the exterior walls of sheds abutting on lanes or passages other than streets shall be constructed of brick or stone, not less than nine inches in thickness.

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Section 69 of the said By-law is hereby repealed, and the following inserted in lieu thereof :

"69. All buildings erected in terraces or rows must have one brick party wall to at least every thirty feet in length of frontage, and such party walls must be equal in thickness to that required for outer walls, and be carried eighteen inches above the roof, as before mentioned. The party walls in all semi-detached houses must be carried up close and flush to the roof boards to divide each separate tenement, and to go through the roof to every second tenement, with parapet walls."

PERSONAL

Mr. J. W. Siddall, architect, left Toronto recently for a visit to Europe.

Mr. Brydgeman, architect, late of New York, has recently opened an office in the Canada Life Building, Winnipeg.

Mr. Robert Wilson, formerly a well known Toronto contractor, is now local manager at Winnipeg for Mr. H. C. Stone, architect, and is also superintending the construction of the new Union Bank Building in that city for Messrs. Darling, Pearson & Over.

Spratt, Rolph & Chrysler, architects, have established an office in the Thompson block, Main St. Winnipeg, in charge of Mr. Chrysler. The firm have prepared plans for alterations and additions to the Commercial Club, and have also on hand a considerable amount of other work.

Mr. George Browne, one of the pioneer architects of Winnipeg, is about to retire from practice and take up his residence on the Hudson, about twenty-five miles from New York City. Mr. Browne has been a resident of Winnipeg since 1878, and has designed and superintended the erection of many of the important buildings of that city. His removal is very much regretted.

The Galt Art Metal Company, Limited, is a new concern which has recently started business in Galt, Ont., for the purpose of manufacturing architectural sheet metal material. The directors of the company are prominent business men of Galt, the manager being Mr. J. H. Hayhurst who was for a number of years manager of the James Warnock Company, Limited, and who, on severing his connection with that Company, was made the recipient of a gold headed cane by the employees.

WINNIPEG BUILDERS' EXCHANGE.

At various times during the last fifteen years organization has been attempted by contractors in the building trades at Winnipeg, but none of these was ultimately successful. The Winnipeg Builders' Exchange, organized last month, is founded on a broader basis, and we believe is destined to endure, and to serve a useful and important purpose. The Exchange has already a membership of nearly one hundred of the leading contractors and supply firms in all lines. Convenient and commodious quarters have been secured in the Rialto Block, 482½ Main St., where a number of important

Mr. E. Cass,
President Winnipeg Builders' Exchange.

meetings have already been held. The success of an organization of this kind depends very largely upon the Secretary. In Mr. W. W. Daly the Exchange have secured a most painstaking, obliging and efficient officer, who may be depended upon to do everything possible for the success of the organization. The other officers, directors and members of the Committees are

Mr. G. W. Murray,
1st Vice-President Winnipeg Builders' Exchange.

as follows:—President, E. Cass; First Vice-President, G. W. Murray; Second Vice-President, Joseph Bourgeault; Treasurer, T. D. Robinson; Sergeant-at-Arms, Alexander Irwin. Directors, E. S. Harrison, Angus Browne, W. A. Irish, D. Cameron, John Douglas, J. W. Morley, Thomas Cotter, J. A. Girvin, R. Watson, Victor Bouche, William Alsip, and C. H. Simpson. Legislative Committee, Mayor Sharpe, Chairman; William Garson, T. D. Robinson, William Irish and Wm. McFarlane. Finance Committee, A. T. Davidson, Chairman; Duncan Sinclair and Angus Browne.

Mr. Jos. Bourgeault,
2nd Vice-President Winnipeg Builders' Exchange.

Resolution Committee, A. J. Hammond, Chairman; C. N. Sharp, W. H. Fraser, W. Malcolm and A. N. McCutcheon. Membership Committee, Philip Burnett, Chairman; A. B. Anderson, W. Wilson, J. W. Wright and William Hanbury. Labor and Grievance Commitee, George Mitchell, Chairman; F. Powell, C. Gate, A. J. McMartin, C. A. Bell, S. B. Ritchie, John

Mr. W. W. Daly,
Secretary Winnipeg Builders' Exchange.

Douglas and J. H. Neil. We have the privilege of presenting herewith the portraits of the chief Executive Officers of the Exchange.

The objects of the Winnipeg Builders' Exchange, as set forth in the Constitution, are as follows:—1. To join in one Association all contractors, manufacturers and dealers of good repute doing business in the city aforesaid, whose vocation connects them, wholly or generally, with the industry of building, either as employing contractors in any branch of the building business or as manufacturers of or dealers in material used and employed in the erection of buildings or other structures, and who are not members of any Journeymen's Trade or Labor Union.

2. To establish and maintain among the individuals so associated a just and equitable system of dealing, and a uniformity in commercial usages by rules and

Ivey Building.—H. C. McBride, Architect.

regulations; to acquire, preserve and disseminate valuable information regarding the business in which they are severally engaged.

3. To procure (either by lease or purchase), furnish and maintain suitable rooms for the use of its members for meeting rooms, offices and other purposes.

4. To establish and maintain a system of adjustment of all disputes or controversies which may arise between its members or between its members and their employees and other persons, and for that purpose to act in concert with similar organizations.

One of the first subjects brought before the Exchange for its consideration was that of a uniform contract drawn up with a view of securing justice and fairness to all the contracting parties. In Winnipeg, as elsewhere, the want of such a form of contract has been keenly felt. In its absence, contractors have been obliged to consult and pay for the services of a lawyer to examine every contract which they were called upon to sign. Frequent objection was made by the lawyers to the terms and conditions of the contract, causing trouble and delay. It is the hope of the Builders' Exchange that a form of contract may be adopted which will be satisfactory alike to architects, owners and contractors, and which will do away with the difficulties which have been experienced in the past. As a united body the Exchange will also be in a position to deal with other difficulties such as inadequate transportation, delayed cars and unfair and excessive demurrage charges, labor troubles, etc. The Exchange will furnish a list of its members with their names and addresses to the architects of the city, and request will be made of the architects to furnish the Exchange with a copy of all plans and specifications for its members only. It is expected and hoped that next winter lectures and papers on subjects of interest to the members may be obtained and presented at the meetings.

Taken altogether the Winnipeg Builders' Exchange will be, as in other large and growing cities, a source of great benefit to all identified with the various building interests, and if loyally supported by the members will become, as elsewhere, indispensable.

THE TORONTO FIRE.

The accompanying photographs illustrate the class of buildings that met their fate in the recent conflagation.

Effect of the Fire on Warehouses Immediately East of the Ivey Building.
Part of a Copyrighted Photograph by Galbraith Photo Co.

Some idea of the intense heat can be had when stone fronts like this are fairly melted.

The Ivey building was saved only on account of the fire wall at the side. It is one of Toronto's modern warehouses—the front above the ground floor windows being built of New York pressed brick and trimmed with Roman Stone which is in itself a fireproof material.

WHAT CONSTITUTES BEAUTY IN ARCHITECTURE.*

By Barry Parker.

Mr. Barry Parker recently delivered a lecture (in two parts) at the Glasgow Exhibition before the International Association for the Advancement of Science, Arts and Education, under the main title of "Wherein Beauty in Architecture lies," and the sub-title of "Placing of Light and Shade, Detail, Masses and Ornament."

Mr. Parker said that he had been led to the choice of this subject by a feeling which had grown upon him more and more, year by year, that those interested in the development of the knowledge and perception of truth in art do, in their attemps to help one another, almost invariably miss what is perhaps most important. Anyone setting out to help others to a knowledge of architecture, whether it be to train students with a view to their practising it as a profession or with the aim of guiding others to some understanding of what they see, always approaches his subject from some point of view other than that of trying to show them some main principles or guiding instincts which have led to beautiful results in all styles and periods, and at all times, throughout the history of the art.

He teaches his pupils building construction; he teaches them architectural drawing; he teaches them any amount of the history of architecture, its development from style to style; or even some abstract mathematical systems of proportions, to their infinite and irrevocable loss of ability for any broader grasp. He teaches them the art of planning economically and conveniently; perhaps even the adaption of the architecture to the climatic conditions of a country, and the habits and mode of life of a race. He will probably go so far as to state that he feels this building to be beautiful and not that, but does he ever attempt to teach wherein lies the beauty of the one and the failure of the other?

Mr. Parker did not ask that the teacher should point out why the attainment of beauty lies in the recognition of this or that broad principle or æsthetic instinct; that would, he said, in most cases, be beyond what it would be fair to ask. But by a thoughtful comparison of many buildings belonging to all styles and all periods he could discover and points out right instincts, always followed, and factors always duly valued in successful work the world over—in fact, wherein the beauty of a building lies.

He went on to point out that this absence of any attempt to create a power to analyse into its constituent elements the beauty of one building, and to see what has led to the absence of beauty in another, was another characteristic of our art training today, which made for the increase of that army of copyists (incapable of the least originality) by which the progress of the art of architecture is so lamentably hindered. For he who has merely seen that one building is beautiful and another not, and has never approached either with any attempt to discover the qualities making for success or failure, will have no idea of doing anything more than reproducing what he has seen to be beautiful as slavishly as the new conditions in which he is placing it will admit. He will have no power to see that he commands the qualities which have made for success.

By means of a sketch of a window in Florence he had recently made for this purpose, and a photograph of a pulpit in Milan, and another of the Duomo in Florence, he showed how rightly to meet the differences in ornament demanded by considerations of distance from the spectator; how only vulgarity resulted from simple magnifying ornament because it was to be seen from a distance, and only irritation in the beholder by so designing that it could not be properly seen; how a truly happy result could only be got by designing ornament which was to be seen from a distance, simple but refined in detail, avoiding above all things multiplicity of different forms, that it may be easily grasped from a distance and satisfactory on close inspection.

Not the least interesting part of these lectures was that treating of the province of design in bringing into harmony the works of nature to the works of man; the province of design in introducing growing forms among architectural forms, and architectural forms among those of wild nature; the due fusing of the one into the other, and the softening of the abrupt contrast by frankly acknowledged art.

Finally, among the main principles in design which Mr. Barry Parker laid down as forming as it were the framework, he laid great stress on the following: "Everything anyone is called upon to design has certain clearly defined requirements, purposes and conditions, and the form must be given it which will best enable it to fulfil these before any other considerations may be entered upon. It is doomed to certain artistic failure if, from mistaken notions of the distates of aesthetics, it is given a form which will make it less able to perform its functions than would some other form; and the ability and inability of the designer is shown in the degree he makes it satisfactory to our aesthetic instincts, while at the same time he enables it to perform its functions as perfectly as possible." He also emphasised that its torm must at the same time be one which revealed and explained the construction; not one which attempted to conceal it.

From his want of power to analyse the beauty of his model into its constituent elements he would be certain so to adapt it to its new conditions as to destroy that beauty. Mr. Parker showed on the screen photographs and sketches of many European buildings, pointing out how the disposition and placing of the main masses of light and shade must take precedence of all other questions if beauty, and not entire loss of dignity is to result. He demonstrated the truth of this by showing various examples ot buildings where there was no massing of light and shade; the light was all broken up, and the shade was all broken up and spread in little patches and strips universally over the whole building. He went on to show that to gain beauty it was necessary there should be not merely restraint in the use of detail, and a sense of fitness in the parts selected to be finely detailed, but the right perception of the way in which the detail should be concentrated or grouped. "No truly happy effect ever was or ever can be produced where small and great are disposed universally over the whole surface of a building, and where no thought is given to the enhancing of the light parts and details by opposing them to the massive, the broad and the simple, where all parts are equally enriched, whether greatly or slightly, with mouldings,

*Abstract of a lecture recently delivered before the International Association for the Advancement of Science, Arts and Education. Reprinted from The Builders' Journal.

ornament, colouring, or in any other way, as is the case with so many modern buildings in which all enrichment is spread, profusely or sparsely as funds allow, equally over the whole facade."

He deplored the loss of power to rightly value plain surfaces, and showed by means of the lantern how much of the beauty of the work of the past resulted from due appreciation of these.

THE LIGHTING OF A HOUSE AND ITS EFFECT UPON THE DECORATIONS.

A good part of the usefulness of a house comes at night; it is then that we most generally throw open our house, so the problem of artificial lighting becomes a very important one. Many houses are ruined by bad lights. You can furnish a room ever so elaborately and make it seem quite bare by having a blaze of lights in the wrong place; you can seat your guest ever so comfortably, and make his visit a torture by having a glare directly in his eyes; and you can furnish your room ever so cooly for summer, and then heat it to the boiling point by ill-advised attempts to illuminate.

Fortunately, as it happens, one simple rule rigidly adhered to will bring you safely out of any difficulty.

The light should never shine directly in anyone's eyes. There is, perhaps, only one exception to this rule. At one's dressing table the lights are rightly left bare, for that is the place where one wants to see quite plainly, and where anything cutting off the light would be a hindrance.

Comfort absolutely demands the shaded light, and so does decorative beauty. A mild, soft light is always to be preferred to a glaring white light; and the shades of the lights are really the easiest way of successfully introducing colour into your scheme of decoration. It is possible to have various colours, but perhaps the best effect is obtained by having all the lights in a room the same colour. A drawing room with all the lights in pink may be made a delightful spot in which women look their best. Red and yellow are good colours, and increase the rich and mellow look of the room in which they are used. A library papered in green, with white woodwork, looks peculiarly restful and studious, with the somewhat old-fashioned white-lined green shades on the reading lamps.

Blue and most greens are to be avoided as giving the room and the people in it a ghastly look. The whole effect of a room can be changed by the colour which lights it.

As to the decorative difference between high and low lighting, anyone who has ever lived in a sparsely furnished room can bear witness. Light a ring of gas jets up near the ceiling, and the whole room looks barren. The ceiling itself becomes the most prominent feature of the room, and its bare expanse dominates the whole apartment. Put your lights down a little lower, and let the lights fall on your rugs and what furniture you have; let a slight dimness in the farthest corners distract too much attention from them, and you will find the room which was formerly barren will take on a comfortable, snug look.

The same rule applies to rooms which are furnished to their fullest capacity; the ceiling is not the feature to be emphasized, and high and unprotected lights are sure to bring about this result. Of course, to this rule there are exceptions. For example, suppose you are wanting to light a ballroom, the ceiling of which is so high that lights up there are safely out of the range of the eyes. The effect of spaciousness is what you want; the room is to be filled with people, and a clear general view must be possible. In such a case the hard brilliancy of uncovered lights is exactly what is needed.

And for those who can employ electricity there is also a possible lighting from the ceiling. A very successfully lit dining-room in New York has a rich coffered ceiling. In the squares between the cross-beams have been placed four flattened hemispheres of pinkish opalescent glass. Behind these and next the ceiling are electric lights, which diffuse a soft pinkish light all through the room. They are not called upon to do all the illuminating, for around the side walls incandescent lights with pink shades and on the tables candles, similarly protected, furnish light. The effect of the lights on the ceiling is very good. The ceiling itself is rich enough to stand illumination, and high enough to bring the lights out of the immediate range of the eye. But the scheme is rather elaborate, and for the simpler type of house out of the question.

There is very little to be said for the ordinary chandelier, depending from the ceiling's centre. In a hall, where it usually assumes the form of a hanging lantern, it is perhaps at its best. In other rooms it had best be removed. If this cannot be done, at least light all jets and turn them very low, rather than have a flaring jet at one side, while the rest of the chandelier is in hideous uselessness.

ARCHITECTS' FEES.

The American Institute of Architects has lately revised its schedule of minimum fees for professional practice. These are now substantially as follows:—

For preliminary studies, working drawings, specifications, large scale and full size details, and the general supervision of the work, the minimum charge is 5 per cent. on the cost of the work. By supervision is meant such inspection by himself or his deputy of work in studios, shops and on the building site, as he finds necessary to ascertain whether his drawings, specifications and directions are being carried out. If the constant presence of a superintendent is necessary, the owner is to pay the cost. For new buildings costing less than $10,000, and for furniture, monuments, decorations and cabinet work the charge is to be 10 per cent. "None of these charges covers alterations and additions to contracts, drawings and specifications nor professional or legal services incidental to negotiations for site, disputed party walls, right of light, measurement of work or failure of contractors; when such services become necessary, they shall be charged for according to the time and trouble involved." When heating, ventilating, mechanical, electrical and sanitary problems in a building are of such a nature as to require the assistance of a specialist, the owner is to pay for such assistance. The fees are to be paid in the following order: On completion of the preliminary sketches, one-fifth of the entire amount; on completion of working drawings and specifications, two-thirds; the remaining two-thirds from time to time.

Only those who have laid a sidewalk can realize the vast difference between work in the abstract and work in the concrete —Princeton Tiger.

MURAL DECORATION.*

By F. S. Challoner

Some one has well said that "all painting should decorate." Decorative painting, strictly so called, however, may be broadly defined as the appropriate filling with graceful lines, subtle or strong, light or dark, masses and harmonious colors, of spaces of various shapes and sizes which are made by the architectural lines of a building. These spaces may be either modelled in low relief or smooth, domed, vaulted or flat. They are sometimes on the ceiling, in the cove and frieze, or around the walls. In every instance they are influenced by their architectural environment. To fill all these panels with great art there are certain qualities other than the best composition, drawing, modelling and technique, that must be present in the work. These qualities which are essentially "mural" are always seen in the best decorative painting, and often are there at the expense of some of the others. One of these mural qualities is harmony. No scheme can be truly decorative unless harmony exists between it and the other parts of the building to which it belongs. To secure this, architect and artist must "pull together," so to speak. Else, though you may have good architecture and good painting, you will have a poor "ensemble." As an illustration, let me quote an article that appeared in Scribner's amongst the Art Notes for April, 1897; dealing with this very aspect of the question, and in connection with the newly decorated Library at Washington. The writer of that article goes on to say: "Many of the mural decorations considered separately are very satisfactory, but considered as a part of a whole they have often failed in conformity and harmony. This has resulted almost entirely from the lack of a systematic plan covering the whole building to be decorated. In place of general supervision there has been individual license. There is variety in it, to be sure, and so there is in a crazy quilt, but what is needed in decoration is not variety but quiescent unity, unostentatious oneness of effect. Some of the pictures not only swear at each other, but at the building generally." Continuing, the writer says: "If our buildings are to be decorated in a proper manner, a scheme of form, light and color, planned and controlled from cellar to roof, by some person or persons, would seem absolutely necessary. The true artist never yet suffered by architectural or decorative restrictions. The axiom of the whole being greater than any of the parts, is as true in art as in mathematics; and the great aim in decoration should be 'ensemble.' An 'omnium gatherum' of wall paintings, however good they may be separately considered, is not decoration."

In order, too, to be in harmony with its setting, a mural painting must, in artists' parlance, "cling to the wall." There should be no attempt to disguise the fact that the painting is on a solid wall and level surface. It must neither seem as though it were modelled in relief nor make a hole in it, but should lie quietly and flatly in its place.

A decoration, therefore, should not be stereoscopic, for the moment you introduce depth of atmospheric perspective, and focus an effect in one place only, as is done in picture painting generally, you at once do break through the wall.

A mural decoration, like a tapestry, should tell as a whole from one corner of the subject to the other. It should also be kept as simple as possible, since a lack of simplicity is disturbing and also prevents it being effective when seen from a distance as mural decorations very often are.

Now, simplicity does not mean emptiness, not a bit of it; it does not mean wholesale leaving out, but skilful leaving out.

The attainment of harmony in color is even more difficult in decoration than in other branches of painting. Color is largely governed by lighting, and in decoration every problem is a new one, as far as illumination is concerned.

Thus, pure colors, such as yellows, reds, blues and gold, which produce an admirable effect in the subdued light of some buildings, would look garish indeed in others that are well lighted.

Where artificial light is used it should be kept at a proper distance from the paintings or they will be cancelled; no pigment can fight against either gas or electricity. In this respect I might mention a couple of ceiling paintings which some of you are familiar with; they are in the front dining-rooms, upstairs, at McConkey's; they are about seven by fourteen feet in diameter, and in one of these the artist has represented the "Coming Day," and a Cupid with a torch lights the whole composition. In the centre of that panel a six-branch electrolier has been placed, and as a natural result that torch that the youngster carries does not count for much, it is quite knocked out by the electric lights. Some other form of lighting that room satisfactorily could easily have been devised, it seems to me, had the matter been given more attention by the architect, and the painting would have looked far better. Simplicity of modelling is another factor in decorative harmony—a factor of the greatest importance. Strong Rembrandt-like shadows are entirely unsuited for this class of work.

Of the evolution of mural painting through the ages to what in the fulness of time has become the splendid art with which we are familiar, its suitability as a means of beautifying the home and the place of worship; the mediums used; the choice of appropriate subjects for the various classes of buildings and rooms; the scale upon which these should be executed, and other matters connected with the execution of the work, interesting to architects, might also be touched upon, had I but a little more time. I will, therefore, proceed to take up the aspect of the question as an educational factor in the municipality. In its minor forms it is little more than a mere embellishment, but even then it helps to make life easier and pleasanter, but when it comes to be applied to the decoration of public buildings it should be significant, either symbolical or commemorative, and it has been so in all its best instances. The people of the past—Athens, Florence, Venice and other European cities felt the value of art in this respect.

* Paper read at the annual convention of the Ontario Association of Architects January, 1904.

They believed that certain benefits arose from the cultivation of beauty; that the pleasures of private life, the dignity of public life were increased thereby. It seemed only natural to such cities that the buildings which belonged to all should be the finest of all; consequently it was on the walls and ceilings of these buildings that the native artists were set to work. Go where you will among the great cities of the past and you will find these painted glories still, works which will make these cities famous and splendid for all time. Those cities made the interior of every public building beautiful. Why should not the cities of Canada? History tells us that Athens spent more money upon her art than upon her wars. And this art was the property of all; it belonged to every citizen who had eyes to see; it was "of the people, for the people, by the people." The history of the city was not shut up in libraries; it was made living upon the walls so that the humblest and least educated citizen knew its principal and worthiest events. Every one is more or less impressed through the eyes, especially so are the masses owing to their lack of imagination. "Pictures are the books of the ignorant," said St. Augustine.

To-day, I have been told, the same citizen in Paris walks around the court-yard of the Invalides, and easily gets the battles of the Republic by heart. At the Pantheon he is taught who civilized his country and who fought for it; he sees Charlemagne as civilizer, St. Louis as law giver, Jeanne d'Arc as liberator, and St. Genevieve as its patron saint. It is the same with the other civic buildings; they are all either decorated or being decorated and dignified by her leading artists, and so, whichever way he turns, he sees on the walls the figures and the stories of those who have helped him in the past and urged along the chariot of progress. In this way the modern Parisian is taught who are the benefactors of France, and when he next sees it he understands the great inscription in letters of gold upon the pediment of the Pantheon, "A grateful country to its great men."

It is the same in other cities of Europe; they have all followed the example of the people of the past, and if the pictured lessons are good for them such would be good to-day for all of us who have occasion to use our own civic buildings.

In our own municipal buildings, above the inner series of arches of the main entrance, you will see some decorative panels and over them the following words: "Hail pioneers; their names and deeds remembered and forgotten, we honor here." If you look around you won't find many of those famous men nor many of their deeds upon those walls. At present, barring the stained glass window, and the portraits, the place is but a whitened sepulchre. This should not be, for what Athens, Rome, Florence and Venice have done in the past, New York, Boston, Washington, following their example, are still doing in the present; Montreal, Toronto, Ottawa, Hamilton, London and Winnipeg, and the other cities of our fair Dominion may do in the future. If these countries thought it worth while, why not Canada? She has much to celebrate, the settlement of the country, the exploration of its rivers and lakes, the achievement of Confederation, our national industries, and lots besides.

MURAL PAINTINGS AS AN INVESTMENT.

In every country there are those who when anything new is suggested ask, "Will it pay? Is there any money in it? Is there a practical side to this celebration of national, civic, corporate and individual achievement?" Most assuredly there is. There are scores of illustrations to be cited to show that the decorations of public buildings may be of some financial benefit to a city or corporation. Everybody recognizes the immense amount of money which the artistic pre-eminence of Paris brings to her yearly in the hundreds of thousands who go to see, to study to buy. Some day, Toronto will be a great art centre, and tourists will pour into it by the hundreds of thousands too; but not until the municipality spends a little money along those lines, because visitors are attracted to a city largely in proportion to the amount there is to see there, its beauties in the way of monumental buildings and sculpture, its parks; magnificent drives; its museum and art gallery; and also the pictured history of the past that is displayed on the walls of its most important buildings.

In the 16th century one of the Popes, Leo X., I think it was, commissioned Michael Angelo to decorate the ceiling and the end wall of the Sistine Chapel, and to-day, if the money could be collected together, which has gone into copies, photographs, and the books that have been written about those decorations, how many such chapels would not the sum suffice to decorate? The same might be said of the Vatican, that was decorated by Raphael, to see which an army of pilgrims have tramped to Rome for nearly four hundred years.

Coming nearer home I might say that the Richelieu and Ontario Navigation Company had thought it worth while to spend a little money in this way in the decorations of their palatial steamers; some sketches of my own are around these walls; they thought it worth while to spend some money in that direction; as it made those boats that much more attractive. When there was nothing else to see out of the windows people required something to see inside. They have not done by any means all that is possible along those lines, they have but started.

The same might be said of some of the theatre companies, some of which have spent a little money in mural decorations, notably the Russell Theatre at Ottawa. Between acts, when the curtain is down, people get tired looking at each other—I suppose so any way—and long for something to rest their eyes on that will have a nice restful feeling in contrast to the movements on the stage. The restaurants also find it pays; you will often find quite elaborate decorations in palatial restaurants.

As for the decorative possibilities of our im-

portant public buildings, they are boundless. Surely no one needs to be told what opportunities are afforded by a great library—such as we are going to have some day, what evolution of civilization by intellectual development may be unrolled upon its walls; what celebration of every sort of literary knowledge from the scrawl of one of our savages upon bark, to the letters of Cadmus, and on to the printing press and modern book. No one for an instant doubts the possibilities of a court house, where all the attributes would show to all onlookers, the wisdom, justice and power of the law; the judgment, moderation, fortitude, clemency that govern the deliberations of a court. In banks, the history of money as a medium may find its legitimate expression; from the earliest barter of savages to the first coin, and from the first coin to the earliest letters of exchange, and so on, down through all the different developments of the interesting history of exchange. Agriculture from the time of the sharpened stake of Abraham's time down to the latest steam plow or other farm implement, might be treated in our markets.

The postoffice and railway station are somewhat akin to each other and for them I would suggest the history and evolution of transportation with all its variety and picturesqueness. Some of the railway stations in Paris are decorated, the Gar de Lyon is a notable instance; in that station there is a series of panels by good landscape men, forming panels around the buildings, of bits along the different branches of the road, by "bits" I mean those particular features in the landscape that are usually illustrated in the time tables or souvenirs given away by railway companies. Our own Grand Trunk Railway and the C. P. R. are trying to do something along somewhat similar lines, but a little more pictorial; they still cling to their framed picture, which, I think, is a great mistake. Between the waits at stations everyone naturally longs for something to look at; at present there is nothing but the time table and a few photographs of views of different parts of the country; and lithographs and show cards of steamship and other companies. How much better it would be if the architect in planning such a building took into consideration that very fact, and instead of using up quite so much marble around the base left a few agreeable spaces which could be filled with landscapes, views of cities, or the battle fields of the country, if there are any—we have a few—and a number of other features; I am sure the time would pass very much more pleasantly and a great deal faster.

When art was at its highest tide the artists' best patrons were the great corporations, the syndicates of the time. To-day, in Canada, there is plenty of room for the celebration by our corporations and industrial companies of our electrical, mining, lumbering, manufacturing, insurance and various other companies, whose history or business possess great decorative opportunities.

I do not think it would be out of place just here—I might have quoted it earlier—to read a clipping from an American newspaper which deals with Pennsylvania's new state capital. The article states that the State of Pennsylvania has determined to make the new capitol at Harrisburg one of the foremost examples of a building in which the architect, sculptor and mural painter have worked in absolute harmony. To show the magnitude of the opportunities and the liberality of the architect and of the commonwealth. The first detailed announcement of this important project involved $300,000 for sculpture and $150,000 for mural painting; the mural paintings are to be by Mr. Edwin A. Abbey, who is a native of the city, and the sculpture by a sculptor who was also born in that State, Mr. George Grey Barnard.

I think it would cause some discussion in the press if Mr. Ross and his Cabinet were to do likewise; still, there is no reason why they should not do it, and I think it would pay them to do it, as it will pay Harrisburg, in the number of people that will go to visit that town to see those mural decorations and to see that sculpture.

On mural painting as the greatest forms of painting I will now say a few words. Most people still seem to have an idea that mural painting is an inferior branch of art as compared with picture and portrait painting. This impression, however, soon passes away when they take the trouble to read art history or to seriously consider the decoration of any important surface with all its difficulties, intellectual and material.

A mere enumeration of the names of decorative artists ought to convince those who have not seriously considered the matter.

The greatest works of many of the greatest artists who ever lived, Michael Angelo, Raphael, Leonardo di Vinci, Correggio, Veronese, Tintoretto and others were essentially decorations. The landscape schools have arisen since the great decorative days of the Renaissance, therefore they had little practical part in the decorations of the past; but in a new decorative Renaissance, there is no reason why they should not play a part and a brilliant part too. For monumental public buildings it is probable that the great symbolical ideal, call it what you will, picture will remain the highest expression of mural art as in the Vatican, the Ducal Palace and the Sorbonne; but besides this and the historical picture, every other form of art finds place in decoration; the landscape and marine may be at once decorative and commemorative; the easel picture, if properly placed, properly lighted and properly hung may decorate a room even more delightfully, because more subtly, than would the finest porcelain or metal work.

Realistic portraits also would make magnificent decorations if properly panelled into walls and over mantels; this has been done in some of the "old world" buildings with magnificent results.

In our own City Hall there is an excellent illustration of how bad pictures look hung on a white wall without an architectural setting; they make nothing but a series of black holes and spots all along that corridor. That same corridor could easily have been panelled so as to have made a suitable frame or setting for the portraits of the various mayors of the city, past and to come.

NEW BUILDING REGULATIONS FOR TORONTO.

Attention is called to some of the new building regulations for the city of Toronto printed in this number. These comprise only a section of the new building by-law which it is proposed to put in operation at an early date. The city architect and city council are to be commended for having taken prompt action in this matter, thereby forestalling the erection of an undesirable class of buildings. Unfortunately a difference of opinion has arisen between members of the architectural profession regarding the new regulations which have already been adopted. The chief objection raised is in relation to the clause specifying the percentage of window openings in walls, and providing for an increase in the thickness of the walls where the percentage of openings is increased. While it is desirable that the cost of buildings should not be unduly increased, and building enterprise thereby retarded, the new by-laws should compel the construction of substantial structures capable of withstanding fire. One of the chief requisites of such buildings should be substantial brick walls.

It is gratifying to note the energy with which the burnt district is being cleared and prepared for new buildings. It is not likely, however, that all the buildings destroyed will be immediately reconstructed. Probably not more than from one-third to one-half will be rebuilt this year, and probably some will never be rebuilt. A sufficient number will be erected, however, to insure an unusually active building season; already the demand for bricks and certain other lines of material is greater than the supply. The scarcity of these materials is likely to interfere with the progress of new buildings outside of the business quarter of the city.

NOTES FROM QUEBEC.

[BY A CORRESPONDENT.]

Just at the present moment there is no great activity manifest in the building trades of Quebec The prospects, however, for the near future are very good, many of the leading architects have in hand plans for erection of new buildings, as well as the rebuilding of many old ones within the city, (mostly business houses), these in the aggregrate would form a substantial total and should mean a good wave of prosperity to the various trades concerned. The present unsettled state of "labour" is consequently causing no little anxiety, and is making itself felt in the great difficulty experienced in getting contractors to give solid quotations.

There is a movement on hand among the labour unions to open their shops and undertake contracts for its members, but this is not expected to meet with great favor, one of the strongest objections being the difficulty there would be in getting guarantee of specific performance, which is now obtainable through a substanial contracting firm.

It is hoped that the painters difficulty will be settled before the 1st May and it is generally expected that this will be the case.

Should, however, the carpenters force a strike, as is threatened, the effects may be of such a character as to cause serious loss and hindrance to this year's business, and the carrying over to another season of several of the projects on hand.

In addition to the immediate work referred to in the city itself several of the leading architects have on hand some important work for other towns and districts, many of which are eccelesiastical buildings. Any development in the labour situation, would therefore be greatly deplored as a menace to the steady run of substantial business which appears to have set in.

The project to pull down and clear away the old and unsightly buildings at the top of Mountain St. has now taken tangible form and estimates for the work are expected to be called for shortly; this will give an additional area to open space of some 4,000 sq. ft. in a fine and imposing position.

It is also in contemplation, when this is done, to erect on this space a statue in honor of Mgr. de Laval, the founder of Laval University, which is in close proximity.

The Committee having this matter in hand are now considering as to the best course to follow, whether to call for drawings to be submitted for consideration and thus select the most suitable, or to instruct an individual architect to do the necessary drawings to the committee's instructions.

The continued steady system of improving the public buildings and open spaces, which has been followed by the municipal authorities during the past ten or fifteen years is now making a marked difference in the appearance of the city and general satisfaction is expressed with the result.

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BUILDING CONDITIONS IN MONTREAL.

Until quite recently it was believed that no difficulties were likely to arise this year between workmen and employers in the building trades in Montreal. This expectation has, however, been disappointed. A partial strike of stone cutters has already occurred. The painters' demand that the rate of wages be increased to 25 cents per hour and also that the working hours be reduced to 54 per week has failed. There is also difficulty on the part of the plumbers and bricklayers.

"Mandy, d'ye recollect how Henry Wiggins used to play marbles all the time when he was a little feller?"

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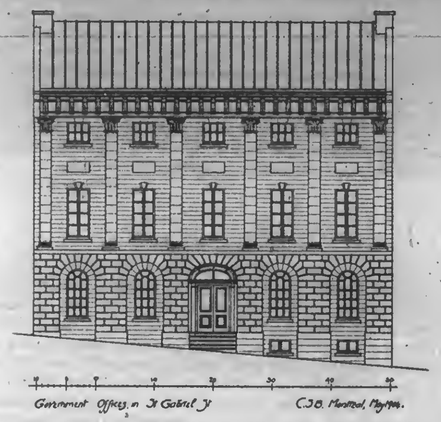
MONTREAL LETTER.

No. II.

The remarks of "Gargoyle" in the last issue called forth in certain quarters some indignation as if it had been the intention to cast a slur on the fair name of Montreal, on account of practices in architectural matters in which the men who build in these parts fail to set their faces "straight to the instant need of things" or have at least so far failed to find adequate and satisfactory solu-



Government Offices on St Gabriel St C.J.O. Montreal, Photos.

tions in the case of some of the most pressing demands of the climate—perhaps partly for the very reason that the optimistic Canadian will persist in thinking that the rigours of his climate are entirely overestimated by the rest of the world and can really be met in any old way. These off-hand ways of meeting difficulties, though they may serve their utilitarian purpose for a while, are little likely to be satisfying as a matter of art, least of all in architecture which demands before all things evidence of skillful forethought and the suggestion of permanence. Bacon's idea of art as the "adaption of the shows of things to the desires of the mind" is the golden rule that must inspire whatever of the handiwork of man is to find any lasting favor or good repute.

Though Montreal may not be a sinner above all other cities in these matters, yet the instances quoted by "Gargoyle" show that here as elsewhere we are far from any finality in the problem of meeting the case. To get our window sashes and other simple essentials efficient and at the same time satisfying to the eye is to have laid well the foundation of our architectural design. Without this the framework of our buildings may ascend to heaven but their souls will still cleave to the dust.

Some of the humbler old Montreal buildings referred to last month as exhibiting the satisfactory result of perfectly simple and at the same time perfectly unself-conscious methods of providing desirable accommodation and comfortable protection against climate are illustrated by sketches this month. They exhibit the common sense of a tradition inherited from intelligent workmen, wanting their buildings to be strong from the pleasure all men take in strength and to be comfortable because comfort was an idea that appealed to their own minds and they took a natural delight in finding themselves contributing to the sum of human happiness. At the opposite pole from these old homes stand the inanities which have been obviously considered by their builders as machines for turning coin into other men's pockets.

Amongst Montreal's old buildings however are to be found some of a more imposing air and of a public character, which whilst standing distinguished from their private and less assuming neighbors, still wear without affectation the mantle of directly inherited tradition. There is the Inland Revenue Building facing the river and there is a row of buildings in Notre Dame Street almost opposite the head of St. Lambert Hill which is quaint and pleasant. The building near the east end of St. James Street occupied by the Credit Foncier has more than a reminiscence of Adam's work. The Government Offices in St. Gabriel Street

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nearly opposite the wing of the Law Courts now in progress is a fine old building.

On the last mentioned building certain young gentlemen have lately been observed hard at work in their shirt sleeves with foot-rules, tape-lines and sketch-books, and it is understood that the McGill College School of Architecture is in this way seeking to preserve an authentic record of some of the ancient land marks of Montreal and at the same time to wean its students from drawing paper, photographs and plaster casts and to introduce them to things as they are in solid fact. As the sight of the student at hand to hand grapple with his subject is usually an inspiring and infectious object lesson to aspiring minds it will be surprising if others outside of McGill do not also take up this, the most natural and most delightful introduction to the study of architecture. Montreal may not possess many monuments of a quality to repay this sort of study, yet such as they are they make this city rich indeed in comparison with others that are entirely without them. They are sufficient to give the key to unlock the treasure-house of the past for all desirous to make the history and tradition of architecture of some value to their minds, and inasmuch as they are not so very far removed in date and sentiment from the present day they are all the more within the capacity of the young student to appreciate and derive benefit from.

Whilst on the question of architectural training it should be observed that the Province of Quebec Association of Architects has just announced a Scholarship which it is offering to students. This takes the form of four years training in the course for the Bachelor of Architecture Degree at McGill University offered free to one student presumably—each year. There is nothing very formidable in the list of subjects set for examination and any beginner who should be afraid to enter the contest would do well to seek his life's amusement and instruction in some other line of life than architecture. It is a common complaint against young architectural associations that they do little for the training of the youth of the profession—the complaint in general coming of course from the somnolent and unimaginative members who fail to realize that such an association has objects to fulfil which if not more important, do at least require first attention. The Province of Quebec Association seems however to be making a beginning in this direction, and one must now look to students themselves to respond and to take some of that common interest in things which carries men so much farther than individual interest alone can do.

The revolution in the weather inaugurated on the 1st of May combined with the lapsing of old and entering upon of new leases on that date occasions a special stir amongst the building trades. Hence the time becomes a favorable one for strikes amongst workingmen. The painters, the marble cutters and the plumbers have each had their various grievances to ventilate. The plumbers alone have sharply contested the issues at stake. In these matters again the climate becomes a factor which cannot be ignored. If work is to be impeded during the coldest months of the year working hours must naturally be longer during the favorable season or the country will fail to keep abreast of her neighbors. It is only cutting according to one's cloth.

GARGOYLE II.

BUSINESS NOTES.

The new organization of the Locomotive & Machine Co., of Montreal, Limited, is making rapid headway. They have recently moved to a fine suite of new offices in the Imperial Bank building, Montreal, overlooking Victoria Square, and are now fully organized for business. Their extensive works at Longue Point are under way and well nigh completed, and are equipped for almost unlimited expansion. The whole of the structural steel for these buildings, which is of a most complete nature, was manufactured by the company themselves, and are a marvel of completeness. It is intended that while keeping the Canadian company quite separate, at the same time to keep in close touch with the American company, so that the full advantage of the experience and progress of the American concern may be secured for the Canadian company.

NOTES.

The Master Plumbers' Association of Winnipeg held their first annual dinner on the 13th inst., which proved to be a most enjoyable event.

In a recent lecture on geology in Glasgow, Mr. A. McWilliams, A. R. S. M., stated that granite consisted mainly of two minerals, quartz (hardness proportionately 6) and felspar (hardness 7), whilst the hardness of a best-quality Sheffield pocket-knife blade was 6½, the wearing powers of granite would therefore be readily understood. Pure clay with less than about 2 per cent. of potash and soda was a fireclay; if white, a china clay or a pipeclay; while containing 5 per cent. of oxides of iron and generally a fair amount of potash and soda it became an ordinary red brick clay.

A contractor with very large experience in Portland cement work, particularly in the making of walks and floors, asserts that he has never used any mixture of cement and sand for such purposes that has not been notably improved in wearing qualities by the addition of black color. Nor has he ever taken up work where black and gray tiles alternated in which the gray tiles were not inferior. When Mr. J. C. Plant finished the Phœnix building in Minneapolis with Portland cement tile floors in corridors and offices, the idea was so new as to be classed with the experiments. Red and gray tiles were used and the difference in the two is very noticeable at present, and all in favor of the colored tiles. Lampblack is generally used for coloring these tiles black, and in the absence of experience one would not predict advantage to come from its use, but so much evidence in favor of the colored tiles must be taken as conclusive.—Western Architect.

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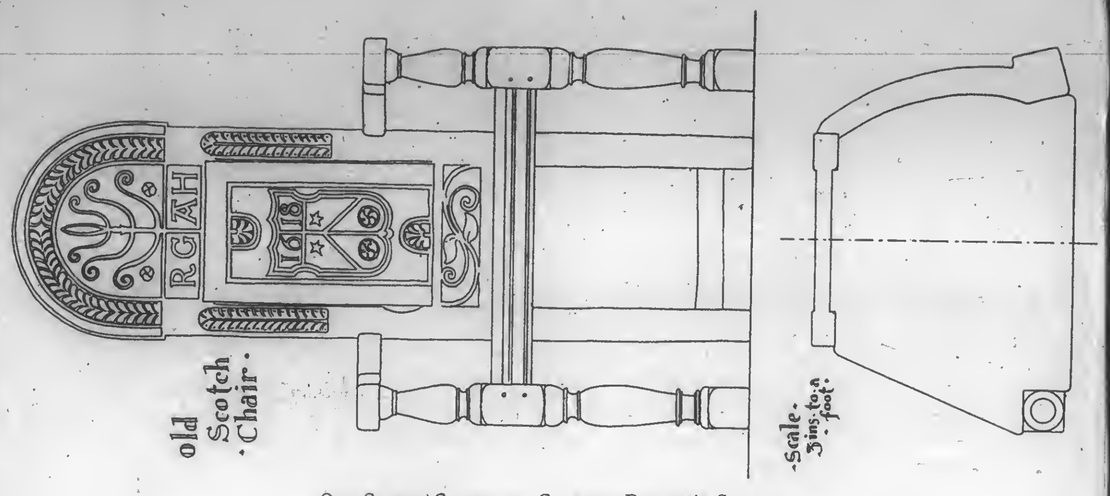
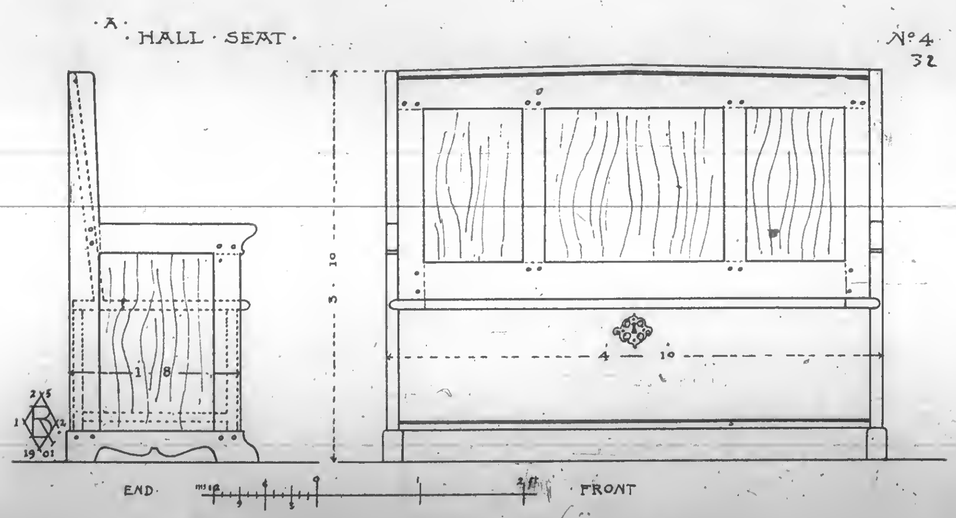
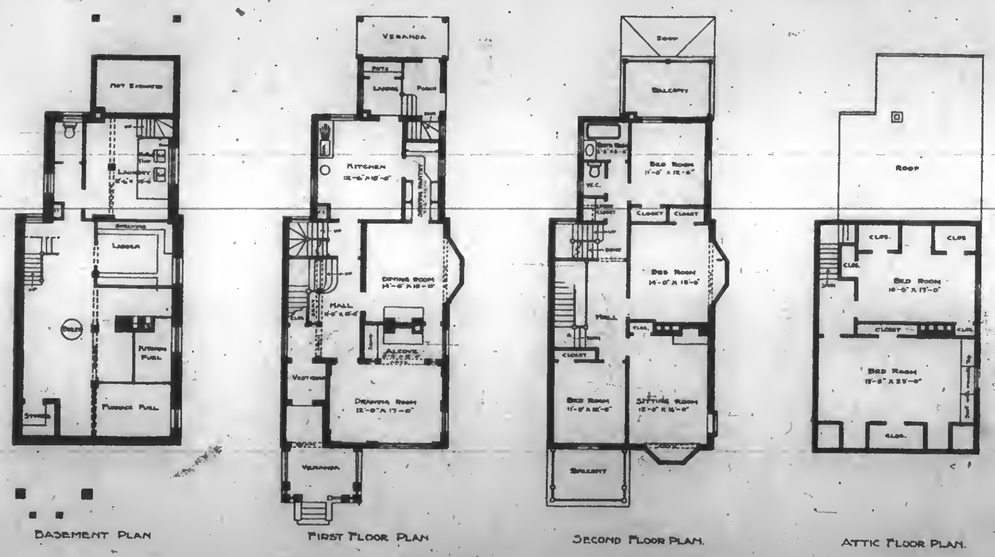


OLD SCOTCH CHAIR IN A GLASGOW PAINTER'S STUDIO.



A HALL SEAT—ORIGINAL DESIGN BY ROBERT BROWN, BOSTON.



BASEMENT PLAN — FIRST FLOOR PLAN — SECOND FLOOR PLAN. — ATTIC FLOOR PLAN.

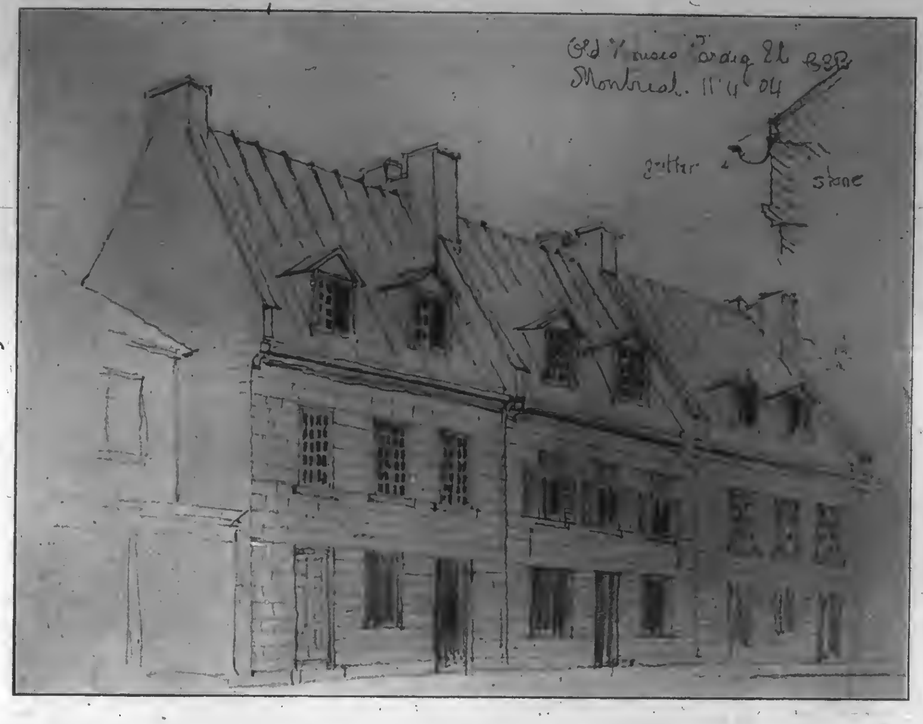
RESIDENCE ON BRUNSWICK AVE. FOR M. WHITE ESQ. TORONTO.

SCALE ⅛IN = 1FT.

BOND & SMITH, ARCHITECTS,
160 BAY ST. TORONTO.

HOUSE IN BRUNSWICK AVENUE, TORONTO.

BOND & SMITH, ARCHITECTS.



SKETCHES OF OLD BUILDINGS IN MONTREAL.

BY "GARGOYLE" AND MR. CECIL BURGESS.

SKETCHES OF OLD BUILDINGS IN MONTREAL.
BY "GARGOYLE" AND MR. CECIL W. BURGESS.

DURHAM CASTLE STAIRCASE.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
MAY, 1904

COMPETITIVE DESIGN FOR GOLF CLUB HOUSE.
GEO. W. GOUINLOCK, ARCHITECT.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
MAY, 1904

The Canadian Architect and Builder

VOL. XVII.—No. 198. JUNE, 1904.

ILLUSTRATIONS ON SHEETS.

Plaster Decoration.—R. S. Lorimer, A.R.S.A., Architect.
Main Corridor, City Hall, Toronto.—E. J. Lennox, Architect.
A Corner at McGill University, Montreal.—Sketch by Gargoyle.
Old Building, Montreal.—Sketch by Gargoyle.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

A Passage in the Falkland Palace, Scotland.—John Knecross, R.S.G., Architect.
House in Crescent Road, Toronto.—Sproatt & Rolph, Architects.

ILLUSTRATIONS IN TEXT.

Views of Houses in Montreal, accompanying Montreal Letter.

CONTENTS

Editorial	97	Inventor of Portland Cement	105
Montreal Letter	98-99	By the Way	105
Wren's Churches	100	The Architect Before the Law	106-107-108-109
Building Material Affected by the New Tariff	101	An Explanation	112
Radiation of Pipe Surface	101	Sources of Heat	112
Northwest Notes	102	Personal	ix
Warehouse Construction	103-104	Method and cost of Heating from Central Stations	x
The Meaning of Art	105	Publications	xi

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" FRED. T. HODGSON, Architect, Collingwood, Ont.

OUR WINNIPEG OFFICE.

The publishers of this Journal have recently opened a branch office at No. 310 McIntyre Block, Winnipeg. A resident representative has been appointed who will be exclusively employed in advancing the circulation of this Journal and in keeping our readers informed regarding the latest developments throughout the west. The kind co-operation of our friends in the west is solicited in behalf of the success of this enterprise.

Window Glass

For a year past the window glass factories of the United States have been closed down, pending an agreement as to prices and wages. The supply of window glass has run very low, the scarcity being enhanced by the recent great fires. The present situation will probably lead to extensive importations from Belgium.

Building Conditions in the United States

The building season opened in New York this year without a strike, a most unusual circumstance. Among the causes which are believed to have brought about this condition are the serious defeat and loss of time sustained by the union workmen last year, the change of date of building agreements from the first of May to the first of January, and the less prosperous commercial conditions now prevailing in the United States.

A New Building Regulation.

An order has been issued by the superintendent of Buildings for Brooklyn which in future will compel the filing of duplicate sets of plans of all new buildings with the Building Department. The duplicate of the plans on file in the office of the Building Superintendent will be kept on the job for examination by the Inspector.

A Suggestion to Manufacturers.

Manufacturers of building materials in sending catalogues to architects would do well to enclose prices. As a rule this is not done, and architects are put to the trouble of writing for prices. We have lately received complaints on this head from some architects who could not understand the wisdom of sending out expensive literature which in the absence of prices is comparatively worthless and frequently finds its way to the waste basket.

A New Employment of Concrete

A grand stand with a seating capacity of 9000, built entirely of reinforced concrete, has recently been completed for Washington University. The area of the land is 450 x 750 feet. The seats and front and rear walls are reinforced with steel bars embedded in the concrete. The seats are supported by

cross-walls 12 inches thick at the base, 8 inches thick at the top and from 4 to 10 feet high. After the supporting walls were in position the seats and risers were built upon them in alternate sections. Careful attention was given to provide thorough drainage of the foundations. The total cost of the structure was about $32,000.

Plastering

Much of the plastering done in Toronto in recent years even in expensive buildings is of a decidedly poor quality. Notwithstanding that the cost of work in this line has greatly advanced, the modern work bears no comparison with the older examples. In much of the work now-a-days, sharp sand and hair —two of the requisite ingredients of good mortar— are conspicuous by their absence. A diligent search might reveal a little hair scattered through the mortar, but the quantity is so infinitesimal as not to have much value as a binding material. When to this is added the fact that the so-called sand employed is oftentimes little better than mud, it is not surprising that the lath and plaster soon part company.

Painters' Convention.

The recent difficulty with their employers having been settled the Master Painters of Montreal are now giving attention to perfecting arrangements for the first Annual Convention of the Canadian Master Painters' Association to be held in that city during the last week in July. Apart from the benefit to be derived from listening to papers and discussions on subjects affecting the painting business, and profiting by the opportunity of comparing experiences with others in the same line of business, master painters' who may attend this convention will receive a hospitable welcome from the local Association in Montreal and will find much enjoyment in making acquaintance with the leading commercial and financial centre of Canada.

Elevators.

The City of Baltimore has recently adopted new regulations governing the installation and operation of freight and passenger elevators. The principal provisions are that the carrying capacity of elevators is prescribed according to the area, which allows one passenger to every 400 square inches of floor space. Operators of elevators must not be under 18 years of age, and must have a certificate from an elevator company that they possess the necessary practical knowledge. The regulations provide that stairways must be separated from elevator shafts by fireproof partitions, and in the case of buildings more than three storeys high above basement, brick walls of a designated thickness are specified. All elevators are placed under the absolute jurisdiction of the building inspector.

Fire Prevention.

The British Fire Prevention Committee have hit upon a novel method for reducing the fire risk in the future. In view of the great loss of life and property due to children playing with fire, the Committee announce that, through a generous donation from a Canadian member (said to be Mr. Chas E. Goad, C.E.), it is able to offer the Committee's gold medal and a purse of £20 for the best fable for children calculated to serve as a warning against the danger of playing with matches or fire. The competition for this prize is open to British subjects residing in any part of the Empire. Elementary school teachers are particularly invited to compete. Two silver and four bronze medals will also be given as additional awards for meritorious essays. Copies of the conditions governing the Competition and all particulars can be obtained at the Committee's offices, 1, Waterloo Place, London, S.W., England, upon application by letter only enclosing a stamped addressed envelope. The Competition will close on the 31st of October next, and the awards will be announced in the leading British and Colonial papers.

MONTREAL LETTER.

No. III.

Montreal is at present looking its best in the fresh green of early summer which happily pervades all parts of the city except the docks. In many directions building operations are in full swing. The hapless remains of the old Mount Royal Club are being collected, and it will not be long before the new Club-

HOUSE ON PEEL STREET, MONTREAL.

house begins to show behind its hoarding. Messrs. McKim, Mead & White are the architects, and while it is a matter for congratulation all round that an example of that rarified classic (with all the Beaux Arts claptrap material chastely omitted), which is associated with the name of McKim, will arise in our midst, it is just a little humiliating to the profession here that the work should go to New York. True we have no one here as great as Mr. McKim, but it is a little surprising to find the Montrealers protective instincts not manifesting themselves. The fact is, art is not ruled by the usual laws of supply and demand, nor is it amenable to commercial policies—not even in this sordid commercial age, thank God! In art the supply creates the demand, which being so all things are possible. But if we pursue this vein of thought there will be no room for news, so to the next site.

The M.A.A. Clubhouse, (Mr. D. R. Brown and J. M. Miller, architects), which is situated on Peel Street, is to be completed before the end of the year, and the first brick was laid on the 4th day of June. The site is one typical of that part of the town

—sliding clay as soft as butter—and heavy piling and concreteing have had to be used. Brown uses as his artistic language that type of Helenized brick building which is rapidly becoming the venacular architecture of the States and which I doubt not

HOUSE ON SHERBROOKE STREET, MONTREAL.

the architectural students of the year 4000 A.D. will categorize as "American 20th Century."

Talking of architectural students reminds me that the McGill Architectural Department Pamphlet explanatory of the new de-

HOUSE ON SHERBROOKE STREET, MONTREAL.

gree of Bachelor of Architecture and the means of acquiring that high sounding title has now been published and copies are being sent to all the architects of the Dominion. In a sense this pamphlet is the "last word" on architectural education, for the scheme therein set forth is in substance a compromise between the training which articled pupils receive in English offices and that obtained in the American Schools of Architecture.

You will find herewith a photograph of a nice little building, Nos. 7,9,11, St. John Street, in brick and stone, which has been recently completed and also of two houses on Sherbrooke St.— Residences in plain gray limestone with dainty wooden porches painted white. For once in a way the porch order is of a scale and refinement which does not contradict the material facts of the case. The outside garb of a house is very like the outside garb of a man. In nine cases out of ten an accurate reflection of the life inside, in the tenth a beautiful swindle. Our respect is due to the man who puts up a wooden column and doesn't pretend it's made of granite, especially when the column is fair to look upon.

I also send a snapshot of a house on Peel Street. The worst we can say of it is that it's rather too consciously picturesque—like a girl, who, without being overdressed or vulgar, has put on she can stand. The materials are yellow brick with gray lime stone corbels and dressings, and the usual thin black slate of of the district, and the combination is decidedly charming, especially when the snow is on the ground. Although the pedigree of this house connects it with the Francis I period it is very

NO. 7-9-11 ST. JOHN STREET, MONTREAL.

near to Scotch work, the same toning down and "solidifying" of the volatile fancies and exubrances of the early Renaissance in France.

It is extraordinary how little direct Scots and English influence there is in the architecture of Canada. Italian, French and specialized American growths are common, but the fact that in no country in the world have the private house and the parish church attained developments comparable with the perfections to be found in England and Scotland, is not reflected in the private houses or the parish churches on this side. Readily do we yield to the French Cathedrals the first place among Cathedrals, to the Italian Palaces the first place among their kind, and to the New Yorkers the first place among the builders of skyscrapers. The domestic work and the smaller churches of England are pre-eminent among such things, and it is high time that more attention were be stowed upon them by those willing to learn from the "old fellows" what can be learned from no other source.

THE GARGOYLE.

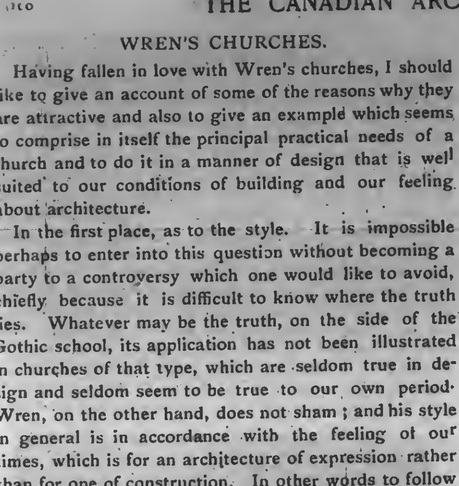
M. Auguste Choisy, inspector general in the Seroice des Ponts et Chausees, Paris, has been selected as the recipient this year of the Royal Gold Medal presented annually by the Royal Institute of British Architects.

The Society of the Beaux Arts Architects announce that they have established a travelling scholarship with a prize of $2,000 to be paid within the next two years to the draughtsman who shall become the winner of a series of competitions to be held between April 16 and July 4th. Competitors must be under 25 years of age.

WREN'S CHURCHES.

Having fallen in love with Wren's churches, I should like to give an account of some of the reasons why they are attractive and also to give an example which seems to comprise in itself the principal practical needs of a church and to do it in a manner of design that is well suited to our conditions of building and our feeling about architecture.

In the first place, as to the style. It is impossible perhaps to enter into this question without becoming a party to a controversy which one would like to avoid, chiefly because it is difficult to know where the truth lies. Whatever may be the truth, on the side of the Gothic school, its application has not been illustrated in churches of that type, which are seldom true in design and seldom seem to be true to our own period. Wren, on the other hand, does not sham; and his style in general is in accordance with the feeling of our times, which is for an architecture of expression rather than for one of construction. In other words to follow in the school of Wren (not, that is to say, to imitate in detail) is to design churches in the same style in which we design our other monumental buildings and even our important houses, and that is at the bottom of the attraction one feels for his churches. If the mediaevalist in religion points on the other side to the unchanged character of the Church of England, it is not necessary to enter into that controversy; for the Church of Rome, as to the unchanging character of which there is no controversy, has distinctly abandoned the mediæval style of building without apparently bestowing a thought upon the matter. At any rate one charm that Wren's churches have for the writer of this article is that they are of his own time, and after their adaptation to modern usage in the Church of England, are so nearly of out's that they are both satisfactory in themselves and suggest the possibility of building churches that will not make us feel, when we enter their doors, that we have entered upon another century and a dead one.



To say that Wren did not sham may require the support of illustration. One is given in Fig. 1. If the drawing had been labelled "ceiling" instead of "roof," it would give no handle for doubt. It is in reality a ceiling, an obvious plaster ceiling, made in barrel form and lightened (greatly to the advantage of its beauty) by penetrations for attic windows. The columns are of stone and the beams on them, which carry nothing but a wooden roof and wooden windows, are of wood. This is not only a reasonable construction but looks so. Sir Gilbert Scott in his great London church, St. Mary Abbotts at Kensington, has also a barrel shaped ceiling. It is of wood, but, if we concede that this is a more honorable material, we must stop there; it is not penetrated and is very dull; it springs from a cornice which is some distance above pointed windows, which look foolish in consequence.

If we approach the study of Wren's plans with an open mind, they are full of suggestion, being indeed full of variety. Wren's method appears to have been to include within the walls of a church all or nearly all of its available building area. As the lots were of all shapes the resulting form was often extremely irregular. To reduce these to practicable form there were three principal agencies—tower, vestibule and aisle. By the varied disposition of these Wren produced a series of plans extraordinarily varied, but for the most consisting in the main of a square or oblong area not recessed at the east end. This suited the manner of conducting the church services that remained through the Restoration period and beyond, as a legacy from the Presbyterianism of the Commonwealth. The "three-decker" pulpit rose from among the pews, with seats for the three performers of the service:—the minister who read the service in the middle; below him the clerk who led the responses of the congregation; and above, high up so as to rake the galleries, the preacher abided his time in a black gown and bands. These functionaries remained immovable throughout the service; there was no separate gangway needed for their movements, to keep them apart from the congregation. They did not enter the communion railing except upon the infrequent occasions when the sacrament was administered; and its administration was done with studied simplicity. There was therefore no attempt at what is now-a-days called "an east end". Wren always dignified his communion table with a handsome oak reredos; but the space occupied by the railing was small; it was on the floor level and surrounded by pews, making thus rather an incident in the east end than a motive in its plan. The church was regarded as a chamber in which the central point was the pulpit. The sacraments had a space reserved for them at opposite ends of the church; the font near the entrance, the communion table at the other end. The ceiling followed the floor plan and consists usually of a cornice returning along the east and west walls and a central panel or a series of panels symmetrically arranged over the whole church. This is the first thing that meets the eye now, as one enters the church, and the first impression is usually of a chamber rather than of a church. It is extraordinary how subsequent perception of the floor arrangement dissipates this first idea and how impossible it is to return to it in spite of the ceiling. It would be perhaps well to give an example here of one of the churches, plainest in plan, and reserve for a future occasion an illustration more full of attractive suggestions.

Fig. 2 is a plan of St. Nicholas Cole Abbey taken from an old plan. The pulpit as drawn is all that was shown on the plan, but the seats no doubt, as in other examples which remain unchanged, ran to the east

wall, leaving a space round the communion rail about equivalent to that between the railing and the foot of the pulpit steps.

The south side used to be blocked by a building so that there are windows only on two sides. The difference in the walls is an advantage. The order is quasi-

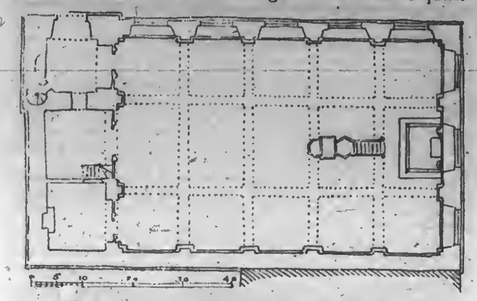
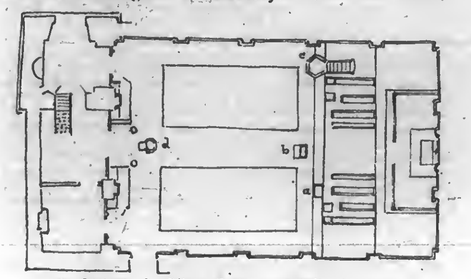


FIG. 2.—PLAN OF ST. NICHOLAS COLE ABBEY.

Corinthian; Wren was apt to use an interesting freedom in the employment of "the Renaissance box of bricks.' The moulding of the ceiling beams is that of the cornice down to the bottom of the corona, and the beams, which have a soffit the width of the upper diameter of the pilasters, mitre with this much of the cornice. The result is neat but a little flat; it suggests coffered panels. The walls frieze and soffit of ceiling and beams are coloured yellow; the order (including the beam mouldings) and the dado black, touched with gilding; an effect striking but satisfactory.



a.—Lectern. b.—Litany Desk. c.—Pulpit. d.—Font.

FIG. 3—SEATING PLAN FOR ST. NICHOLAS COLE ABBEY.

In Fig. 3 is shown a modern seat arrangement compounded of St. Nicholas and other churches; that is to say, there is in St. Nicholas an eccentric massing of the choir on one side, and it seems better for the sake of a descriptive plan, to adopt the arrangement usually to be found in other churches. The dignity is apparent, obtained at the expense of a good deal of space, but it is the nature of the plain plan to get its effects by space; and indeed the lesson to be learned from this adaptation of Wren's plain plans is the excellence of the effect thus obtained. The reduced seating accommodation in a city church is never sufficiently reduced to meet the sparsity of the congregation; for further accommodation, in a church with greater need for seats, the body of the church would stand elongation. If this were done and the ceiling not returned but made to run only from west to east, reflecting in some way the subdivisions of the floor, there would be a good modern church.*

W. A. LANGTON.

*The organ in St. Nicholas Cole Abbey, as in most of Wren's churches, remains in a gallery at the west end.

BUILDING MATERIALS AFFECTED BY THE NEW TARIFF.

Among the changes in the Canadian tariff announced by the Dominion government are some which affect certain lines of building supplies. The duty on plate glass not bevelled in sheets or panes not exceeding seven square feet each, n.e.s., is lowered to 10 per cent. ad valorem. On the same material in sheets or panes exceeding seven square feet and not exceeding 25 square feet each the duty will be 25 per cent. ad valorem.

The maximum duty under the British preference on china and porcelain ware is reduced from 20 to 15 per cent. ad valorem; that on common and colorless window glass from 13 1-3 per cent. to 7½ per cent.

RADIATION OF PIPE SURFACE.*

TABLE M.

RADIATING SURFACE FOR ORDINARY BUILDINGS. RESULTS OBTAINED FROM ACTUAL TESTS.

Compare these with calculations obtained from various formulas, TABLE N.

No		Feet Super.	Feet Super. carried to Col. 1, Table n.	Water	Inside	Outside	Heat Ratio Multiplier	Decimal Equiv. Table K.
13.	Dining Room.							
	Glass	90						
	Wall	300	70	105°	60°	30°	·285	1·
	Ceiling	300						
	Cubic Capacity	3,400						
14.	Office.							
	Glass	370						
	Exposed Wall	1,550						
	Plaster Ceiling	2,130	168	171°	44°	20°	·189	·3
	Cubic Capacity	23,500						
15.	Do.	Do.	353	167°	56°	20°	·324	1·
16.	Do.	Do.	538	175°	68°	22°	·43	1·5
17.	Do.	Do.	723	167°	70°	26°	·556	2·
18.	Do.	Do.	908	161°	76°	30°	·542	2·55
19.	Do.	Do.	1,093	161°	87°	42°	·608	3·
20.	Do.	Do.	1,278	157°	96°	46°	·8	3·6
21.	Church, tiled roof, not ceiled							
	Glass	688						
	Wall	6,000	1,900	170°	60°	32°	·255	1·
	Cubic Capacity	176,000						
22	Drying Room, when empty							
	Glass	30						
	Wall	470						
	Cubic Capacity	4,850	546	180°	100°	40°	·73	0·4
	Matchboard Ceiling	700						
23.	Laundry Drying Room, when empty							
	Glass	25						
	Wall	100	140	200°	105°	47°	·61	0·4
	Cubic Capacity	2,682						

TABLE N.

RADIATING SURFACE REQUIRED FOR ORDINARY BUILDINGS.

Calculated from the formulas of various authorities, compared with Actual Radiation used in Tests shown in Table M, showing discrepancies in the results obtained.

No	1 Actual Radiation Feet super Table M	2 A. Cox G × ·87 W × ·087 CC × ·1214 × H.R. Table D	3 J. KEITH G × ·645 W × ·128 Ceiling × ·064 × H.R.	4 W. J. BALDWIN G × ·85 W × ·085 × H.R.	5 PROFESSOR CARPENTER G × ·1 W × ·25 CC × ·108 × H.R.	6 F. DYE G × ·83 W × ·083 Ceiling ·062 × H.R.	7 W. JONES Rule H G + 6. W + 1½ C. C. + ·150 × Dec. Equiv. Table K
13. Dining Room	70	40	29	28	64	33	70
14. Office	168	136	104	84	222	107	137
15. Same Office	353	234	179	143	380	183	535
16. Do.	538	310	238	192	505	243	532
17. Do.	723	401	308	246	652	314	710
18. Do.	908	590	299	250	655	306	905
19. Do.	1,093	439	366	270	714	344	1,063
20. Do.	1,278	527	443	355	940	452	1,345
21. Do	1,900	863	554	344	1,557	336	1,964
22. Do.	546	105	100	61	192	92	492
23. Do.	140	36	16	17	60	17	147
Totals	7,717	3,531	2,436	1,976	5,921	2,427	7,766

*From a Paper by Walter Jones M. I. Mech. E., read before the Institution of Heating and Ventilating Engineers of Great Britain.

NORTHWEST NOTES

Branch office of the CANADIAN ARCHITECT AND BUILDER,
310 McIntyre Block, WINNIPEG, June 14, 1904.

At the last monthly meeting of the Winnipeg Builders' Exchange it was unanimously resolved that the Exchange adopt the Uniform Contract and that members of the Exchange shall sign no other, the uniform general conditions of which are as follows :—

The Contractor will set out all the works in accordance with the specifications and drawings and have all necessary levelling carefully done and assist at any time or times that may be desired in testing any of the said works.

The Contractor is to employ a competent foreman for each different branch of the trade.

No portion of the work is to be sub-let unless by written consent of the Architect.

The Contractor is to furnish all transportation, apparatus, scaffolding and utensils needed for performing the work.

The drawings, figures and details are to be considered part of and as illustrating the specifications and must be carefully followed. The details are intended to be final concerning all sizes, lines, etc., therein set forth and are not to be deviated from without the written direction of the Architect. Figuring and notes are to be more authoritative than scale sizes, not only in the details but in all drawings, otherwise sizes are to be scaled as accurately as possible and followed.

If the plan and specifications contradict one another or are ambiguous the attention of the Architect shall be drawn to the fact and his decision obtained before the work is undertaken.

The Contractor is to be responsible for all violations of the law caused by obstructing streets and sidewalks ; to obtain correct lines (except side lines) and grades from the City Engineer ; to comply with all requirements of the building by-laws of the City ; to take out and pay for all necessary permits for all temporary obstructions and enclosures, and to pay all proper and legal fees to public officials ; to be responsible for all damages to neighboring proprietors caused by the construction and carrying out of the work in a negligent or improper manner and to hold the proprietor harmless from all claims in respect thereof, and at the completion of the work shall remove all rubbish and waste material from the building, grounds and street and leave the same clean and relay all sidewalks that may have been removed or damaged through the progress of the work to the satisfaction of the Architect.

If at any time the Architect considers any workman incompetent, the Contractor will be required to dismiss the same if requested by the Architect so to do.

Should the work run on until the cold weather, Contractor must heat the building at his own expense if necessary for the completion of the work to be done by him and to the satisfaction of the Architect.

All drawings and specifications are and shall remain the property of the Architect.

The visitor to Winnipeg cannot fail to be struck immediately with the air of prosperity with which he is confronted; on all sides he is face to face with a spirit of progress and confidence, which speaks well for its future and carries the conviction of an established prosperity, and stands in somewhat striking contrast with the deliberate steady ways of the eastern provinces. Undoubtedly Winnipeg has secured for itself not only the premier place among western cities, but fixed itself as the great Commercial City of Western Canada.

The advancement of Canada's Prairie City is clearly marked by the aspect which meets the observer on his journey through the principal streets. Side by side with the fine modern structures which are rapidly springing up on all sides, are still to be seen many of the original one and two story buildings looking strangely antique in contrast to the present-day sky-scraper which is fast gaining popularity.

Perhaps one of the surest marks of success is to be seen in the continual flow of commercial men passing through the city.

The great scarcity of hotel accommodation is another indication of the city's rapid progress. There are altogether some fifty hotels in the City, all catering for the commercial community. Until recently this was considered ample for the city's needs; now, however, hotels are finding increased difficulty in meeting the demands made upon them, and are finding it necessaay to make preparation to supplement their present accommodation.

A large block known as the Assiniboine Block, and at present used as an apartment block, has just been purchased by Messrs. McLean Bros., and is to be converted into an up-to-date hotel. The building is situated in the Main Street, and when completed is expected to be one of the finest hotel structures of its kind.

O'Connor's Hotel on Main St. is also to be replaced by an imposing new building, designed by Mr. J. Cadham, which will be fitted up with the latest improvements.

The permit for the C. P. R. Hotel and new station has been granted. Work is expected to start at once. All the details of this hotel are arranged with the greatest precision, and whilst the outward design is perhaps somewhat plain and uninteresting, it is skilfully planned in point of utility and equipment.

The Queens Hotel on Portage Ave. is to be remodelled under the direction of Mr. Sam Hooper. The plans, which have been submitted, show a well arranged building.

The Leland Hotel, which stands on one site of the City Hall Square, is also to be remodelled. A new billiard room is to be furnished, a new bar and saloon, and additional stories added, which will bring up the capacity to one hundred and thirty bed rooms. The work is under the direction of Mr. F. R. Evans. This hotel stands adjoining the new Union Bank Building now under construction.

The St. Nicholas Hotel is also being remodelled, and an annex is to be added. This work is also under the direction of Mr. F. R. Evans.

The Windsor Hotel is in process of complete renovation. Under Mr. Evans' supervision a new front is to be installed and additions which will greatly enlarge its capacity. The National Hotel is also to be altered and enlarged from plans by the same architect.

An imposing block of business warehouses in the occupation of Messrs. Tees and Persee, Limited, has just been sold to be converted into a hotel, and work is expected to commence at once. The block is prominently situated on Market Square.

A scheme has just come to the front in which the proposal is to erect a mammoth hotel on Main St. to have some 250 bed rooms, and equipped in the most approved style. The promoters are prominent local men.

It will, of course, be some time yet before all this work is completed, and, at the present rate of progress, it is not at all unlikely that the additions will scarcely meet the natural increase of business.

The building permits issued up to a recent date, and which cover in the main, either business premises or dwellings, give a total of some 1,100 buildings, at an aggregate cost of nearly $5,000,000, and it is not expected that this will materially relieve the situation. To this amount should be added the cost of the C.P.R. Hotel and station, the amount of which has not yet been published, but which is considered to be in the neighbourhood of one and half millions.

The City Hall, which occupies a fine position in the centre of the city, is attractive in appearance, is not scarcely commodious enough, although, at its erection a few years since, it was thought to have been sufficient to provide for all expected development. The insufficiency of accomodation in this building will, however, be met in a measure when the new Library is completed by the removal to that building of the present library, reading room, etc., thus giving additional space for offices.

There are quite a few fine business blocks in course of erection, prominent among which is one for Messrs. Miller, Morse & Co. on McDermott & Adelaide Streets, forming a block some 260 x 98 ft. It is to be 5 stories high, and will be of mill construction. It is worth noting that this is the first building in Winnipeg built on this principle. A prominent feature is to be the main doorway. It is to be arched, finished in carved stone, with oak door with grill work in upper panels. The lower stories of building will be constructed of rock face natural stone, the upper part in stone and white brick. The architect under whose direction the work is being executed is Mr. J. Cadham.

There are many conditions with which the builder in this district has to contend which are not met with elsewhere. One of these has been very apparent recently owing, in part, to the recent heavy fall of rain. On one of the main thoroughfares some excavations had been made ready for the foundations of a large block, but owing to some delay were not immediately proceeded with ; in the meantime the heavy rain had come, with the result that although the perpendicular sides were considered to be sufficiently shored, the whole of the sidewalk for some distance fell in, the soil below having shrunk owing to its peculiar nature, the heavy weight of the cement sidewalk bulged out the under soil until the timber supports below were forced out. This occurrence is attributed to the peculiar nature of the soil, which carries some distance below the surface a layer of "shale," very much of the nature of quick sand, and which, when disturbed, is a great source of danger. Builders often find it necessary to provide against this peculiarity by supporting the end wall of a range of buildings during erection until the building is well pinned together and sufficiently strong to carry its own weight.

At another point in the city a similar situation exists, but of a more serious nature, involving danger to a neighboring building. In this instance the Contractor had made his excavations ready for his foundations right up to the adjoining property. During the night the whole of the wall adjoining, and which to all appearance is a most substantial one, sank bodily several inches, without previous warning or showing any sign of cracking (except at the point of parting.) The cause of this particular accident has yet to be decided, but it will, in all probability, be traced to the above mentioned cause. The subsidence caused quite a panic at the time and the building inspector, Mr. Rogers, was hastily summoned. He at once set to work to protect the building, which was done by strapping through and through at top and jacking up the wall above the foundations. By this means the building has been raised to almost its former position.

The Winnipeg Builders' Exchange held their monthly meeting on June 7th in the offices of the Association. There was a good attendance of members, and much discussion on important matters. It was reported by the Committee that the Architects had been interviewed and were almost unanimous in acceeding to the request to deposit a copy of plans and specifications of prospective contracts at the office of the Exchange from time to time. The Architects had also approved of the "Uniform Contract" which had been submitted to them. It was also resolved to draft a uniform form of tender for use by the members, and have same submitted to the next meeting. During the meeting the secretary, Mr. W. W. Daly, addressed the members on the subject of the "Aims and Purposes of the Exchange." The address was received with great enthusiasm and a vote of thanks passed to the secretary. It is proposed to have the address printed.

WAREHOUSE CONSTRUCTION.

If a furniture storage house, a prominent situation on an important street and if possible, where the passing thousands see it, is of great advantage. This need not be in an expensive neighborhood or a retail block and may even be surrounded by cheap stores or residences. But if it is a noticeable building and has substantial signs and is on a car line, or where it is sure to be seen by a great many of your city's inhabitants, you will get ten times as many personal and telephone calls for rates and information as if on a back street, and can save considerable in advertising. It is well, also, if it can be on a business street in the edge of the business district, so that a good portion of the ground floor front can be used as a sales room for second hand and new furniture, or rented out as stores to tenants. But in this connection it is essential to consider whether the patronage of the great middle and poorer classes is expected, or mainly that of the well-to-do and "tony" set, because the latter are repelled and very reluctant to trust their goods under such circumstances, and willingly pay higher rates where the building is held strictly for storage purposes, especially if it says "fire proof," and has formidable iron gates and its front is built with castillated walls and other evidences of physical and financial solidity.

If a heavy merchandise or "dry" storage house, it is not important that it be in a prominent location, or even have a street facing, but it is, of course, desirable that it have a good railroad side track and easy delivery platforms to customer's teams, and the nearer it is to the centre of the wholesale district, the better. If the city is on navigable water, it ought to have both dock and railroad platforms—but it is probably more desirable that the building be within reasonably easy reach of the wholesale customers and freight shipping depots than that it have either of these very desirable conveniences, because goods usually go out in smaller quantities than they come in and by expensive horse and truck, so that a saving of time when goods are wanted, and, a long haul, is an economy to your customers which they will appreciate. This does not apply to an exclusive transfer and forwarding business where the warehouse can be located at the transfer yards in the outskirts of town so long as ample shipping facilities and equal freight rates are had. I venture to suggest if it will not be better, if on railway trackage, that it be on some large railway system not already well supplied with storage warehouses in your city, especially if such a line has equal facilities and advantages on in and out freight—because of the help you will naturally secure from the railroad directing their enquiring customers to you.

It is also wise, before announcing a settlement upon a location, to consult the officials of, say the railway company on whose line you intend building, learning what obstacles, if any, there may be in the way of good switching service to the location—and you can also sometimes secure a specially advantageous switching rate from them, which they would not make you later after you had started to build. You are also more apt to learn from them than from any other source what rearranging or large changes in tracks or railroad facilities which may effect you, are planned for the distant future.

The same general observations apply as to the locating of a cold storage warehouse. Where a considerable share of its merchandise will come from and go to the local wholesale produce commission merchants by team, it is obvious that to be within convenient reach of them is most desirable.

It would seem preferable, in all cities except of the largest class, that a storage plant embrace several lines of warehousing, as say, dry merchandise, U.S. bonded and cold storage, and I would also favor including household goods, for to some extent the advertising of one will help the other, and it is certain it will involve but a small increase in crew to perform the labor in several branches, under competent management. But these branches of storage should not be conducted in the same building, unless it be the dry storage and U.S. bonded, and then it is essential to comply with the government regulations requiring an independent street frontage with separate doors and a tight partition with locked doors separating the bonded from the free storage space.

For a practical and economical plant, I suggest an ideal arrangement would be two non-fire-proof sections, divided by a fire-proof section, and I would, in view of the only slight additional cost, even carry it as far as to make fire-proof the unloading platforms opposite the fire-proof section, and any other communicating parts. If cold storage in connection with heavy merchandise storage is to be conducted, and if it is desired to store fish, oranges, lemons and other maladorous or penetrating commodities, as well as sensitive butter and eggs, it would be well to place the merchandise section between two separate and (except for the refrigerating piping, etc.,) entirely independent cold houses. This will involve some additional cost of insulation but will avoid chance of damage by communication of the odors, and of course the division of the risks by heavy fire walls will always work to your advantage in fire insurance rate.

In a climate where a fairly cheap ice supply can be secured in mid-winter, it would seem highly economical to build your cold storage house with continuous, indirect circulation air chamber between the main insulation and the wall, through which to circulate the air from a stored body of ice, as is in successful operation now in several houses. This is found to secure at the very small expense of a fan power and without labor or handling of the ice, a temperature of about 40 degrees near the outside of the insulation, so the ammonia or ice-salt-and-chloride-of-calcium or anhidrous dioxid, or whatever system is used for the sharper refrigerating, will only have to reduce from a uniform temperature of about 40 degrees F.

There may be another important good served by this indirect circulation in the outer space of the insulation in that it would catch up any leaks of warm air from outside and carry them along back to the ice body, but in fact under reasonably still weather conditions there would probably be, if anything, a slight surplus pressure in this circulating air chamber, so that any openings through the wall would simply serve as slight out-leaks of the inexpensive ice chamber air.

In connection with an ideal arrangement, it would seem an advantage if the railway track can be at an elevation, and come at the back of the buildings on a level with the second or third floor of our, say six-story building. This would save something in elevator

service, would reduce annoyance from stragglers and danger of theft, and allow team platform and delivery access under track at the lower floor level somewhat protected from the weather.

It is unquestionably good practice where the warehouse is not large enough to require a separate delivery and receiving foreman, to have these two departments close together.

Among several reasons why it is wise to have floor strength uniform on each floor of a warehouse, is the fact that the city building inspector always accredits a floor with only the strength per square foot of its weakest part after dividing by their usually high factor of safety.

It is regarded wise to have all floors slightly inclined towards the elevator shaft so that in case of a flood of water from fire engine, or an unroofing storm, it will drain off promptly. This incline need not be enough to be noticeable in handling goods. Sometimes the ground level floor is perceptibly inclined from the rear railway track end to the front truck delivery end, to aid the movements of trucks in the easy transfer of goods directly through the house.

The number, kind and general disposition of the windows in a storage warehouse have generally not received full attention in even the newer buildings erected for this purpose. Very few windows and those placed where they can throw their light down the aisle, and high so there will be the least obstruction possible, would certainly seem good judgment. Every window exposure is a serious outside fire-hazard from an insurance standpoint, bleaches the goods which happen to be opposite it, besides heating the house in summer and cooling it in winter, and presents a vulnerable spot for storm damage and for burglars. While some daylight for handling goods is needed and is much better than to rely on lanterns, and some airing may occasionally be necessary, and direct outside access to each floor and section is demanded by the fire department—it is possible by one window at each end of each main aisle to secure all these with comparatively small openings.

If the glass is the ordinary ¼-inch wire-glass, the danger of fire from without is less and if the wire-glass is set in iron or all sheet metal shod sashes, frame and casing, the danger from outside is reduced to a minimum, and you secure the main protection of an iron fire shutter without its disadvantages. Much help in diffusing light is obtained by having the brick walls at window openings tapered off at 45 degrees on sides and top both inside and out, so that the light can reach each side as well as straight in front of the window. Luxfer Prism glass in aisle windows is as fire resisting as wire glass, and will secure fair light for a great depth through a room, and will prove a desirable feature.

Probably the best arrangement of floors for a non-fireproof building for general merchandise storage, is what has been called the highest type of mill construction, in which only postline girders are used, the floor planking reaching in a continuous line from girder to girder and by virtue of its own stiffness holding the load. The floor planks are somewhat thicker, usually four to six inches, are tongue-and-groove matched together and are of double length reaching over two sections of floor so as to avail of the cantilever effect of the bending tendency.

The writer has devised a system of trussing by inexpensive sheet metal the entire under side of such floors, which has been highly approved by some authorities and which is designed to increase the floor stiffness sufficiently to avoid the need of extra thickness, while it also adds to the slow burning quality of the building.

The number and location of the power elevators is a subject upon which there is divergence of opinion, and many of the best architects and builders strongly advocate grouping the elevators at least two in a stack, but there seems to the writer to be formidable reasons why it would be better policy to scatter them. It is recognized from insurance reasons nowadays almost essential to enclose the elevator shaft in brick, and where the same general class of storage is conducted on both sides of a party wall there is probably no reason why the elevator stack cannot be set in the wall, half in each side, thus serving both sections. We have recently constructed a very satisfactory dry storage house in the writer's city in which, at his suggestion, the elevator was located in the aisle at the back or railway track end. This allows of directly trucking on of goods from the cars for upper or lower stories and is found to save almost a carload of the valuable room on each of the floors except the track level floor. On the latter, of course, a separate side door has to be provided for passing through goods intended for storage or handling on that floor.

The wood now largely preferred for its strength and evenness of grain is Washington fir, which can be had for posts in almost any size timbers. It has within a few years been determined that a large augur hole bored through the centre length of each post and heavy timber will result in the seasoning cracks running to the center, leaving the outside solid, and of course, adding to the sightliness and strength of the structure.

It is often dangerous to cover with oil paint stringers and other construction timbers, because of the tendency to dry-rot when the surface is thus sealed, and it has been a common experience in some parts of the country for the building inspector to make the starling discovery that some main supporting stringers so painted consisted of an inch shell with the entire centre of dry punk. This condition never results, even where timbers were somewhat green when erected, if they are left unpainted, but where a more finished appearance is desired, a coating of any of the several cold-water fireproof paints or of white-wash, will form a good surface, and at the same time add in a probably valuable degree to the slow burning qualities of your building. In this connection it is worth mentioning that these coatings are now easily applied by any large painter, with the use of a spray machine and at an expense for labor of less than one-third what it would be if done in the old way by hand and brush.

As an additional fire protection, it is wise to provide sand-fire doors covered with tinned iron and closing automatically in case of fire by a fusible plug and retaining cord at all wall and elevator openings.

Eighteen sculptors in Europe and America are said to have expressed their intention to compete for the designing of the proposed memorial shaft of the South African Memorial Association.

The Board of the United States General Appraisers are said to have just ruled, in effect, that architects are "artists," and that architectural drawings, for tariff purposes, are dutiable in the same class with "paintings in oil and water colors, pastelz, pen and ink drawings and statuary, not specially provided for."

THE MEANING OF ART.

The word "art," and its adjective, "artistic," are greatly misused, says a writer in Building News. The ordinary Englishman regards art as some sort of accomplishment or process of decoration by which an object, no matter what it is, can be made pleasing or artistic; he thinks it can be applied like a coat of paint or a wallpaper, to any portion of a building or piece of furniture, or anything else, after it is constructed or made, and that the man who can do this is one who can draw pleasing or pretty designs, and can apply his "art" to anything from a fire-grate or coal-scuttle to the decoration of a room. Such is the view of the modern Philistine in art matters. The true meaning of art or architecture is construction dominated by an idea of order or purpose, and the man who designs a building or a fitting or piece of furniture for a given purpose is the real artist. He must commence to exercise his art at the very beginning—to shape his stone, wood or iron according to the use it has to fulfil, not to leave it for others to give it an extraneous expression, or by adding to it a few ornaments. If art, as Morriss says, is "man's expression of joy in his labor," craftsmanship must be actuated by it. Art and craftsmanship must stand or fall together, and it should be our aim to bring them once more together.

INVENTOR OF PORTLAND CEMENT.

Very few of the thousands who make use of Portland cement, and still fewer of the millions who benefit by its use, have ever head of Joseph Aspdin, the inventor of a material to which we owe many of the great engineering works of the present day. Aspdin was a Leeds brickmaker who, in 1813, conceived the idea of combining chalk with clay from the river bed, drying and calcining the mixture at a high temperature. In 1824 he patented the invention, and soon afterwards opened a small cement manufactory at Wakefield, and a few years later his son, William Aspdin, established a cement factory near Chatham. The peculiar advantages of the new material were soon recognized by engineers, and Brunel, as the Builder points out, was one of the first to make use of it, employing Aspdin's patent cement in the construction of the Thames Tunnel. It is true that rival claimants have arisen to claim the honor of inventing Portland cement, but it is now recognized by competent authorities, not only in England, but also in France, Germany and Italy, that the palm belongs by right to Joseph Aspdin. The suggestion is now made that a public memorial should be rised in Leeds to the inventor of Portland cement. The movement should meet with support in America, where the Portland cement industry has shown more rapid progress and has reached greater proportions than anywhere else in the world.

The Royal Institute of British Architects have protested against the new drainage by-laws introduced by the London County Council which require, in duplicate, complete plans, sections and elevations of every floor of a building to be submitted not only in the case of new systems of drainage but any alteration of an existing system.

Mr. G. Gilbert Scott recently read a paper on his design for Liverpool Cathedral before the Liverpool Architectural Society, in the course of which he said he had dreams of quite another style; but his ideas had not had time to mature. Gothic could not go much further: it was nearly at the end of its tether, and before long would die out as completely as it did in the sixteenth century.

BY THE WAY.

A house in Nevada is said to have been constructed entirely of beer bottles and cement. I can easily conceive of many houses that might have been built but for the abundance of beer bottles.

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According to tests recently made at Kew and Chelsea by Prof. Oliver, the atmosphere of London after a dense fog contains a deposit of acids and carbon exceeding 6 tons to the square mile.

× × ×

Prof. Goldwin Smith asserts that the house in which he resides, known as "The Grange," was built in the year 1817 at a cost of only $4,000. The house is commodious in size and substantially built, in the Englisb manor-house style. The interior is finished in oak and walnut, this material being used in abundance for wall panelling, etc. His old house serves as a concrete illustration of the tremendous advance which has taken place in the cost of building in Toronto during the last seventy-five years.

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The expected contradiction has come to the announcement so widely published in the architectural papers of the alleged discovery that by the use of 2 per cent. of tannin in the moist clay the ancients made bricks which were 350 per cent. stronger than those made by our modern methods. In recent tests by Sege briquettes composed of 2 parts sand and 1 part raw clay broke when fresh at 0.56 kilogrammes per sq. centimetre, and after having been stored for three weeks, at 0.92; briquettes containing tannin broke at 1.01, those containing starch at 0.75 and those containing dextrin at 1.71 kilogrammes per sq. cm.

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Dr. Warner, of London, is given as authority for the statement that small heads and physical deterioration are caused by living in high buildings. This conclusion is said to have been reached after an examination of 100,000 children. Unfortunately Dr. Warner has no intelligent reasons to advance why people's heads should grow smaller the farther skyward they go. Presumptuous as it may seem, I am disposed to doubt the accuracy of Dr. Warner's, theory, so far, at least, as this side of the water is concerned. I have known persons whose heads not only did not grow smaller but actually got "swelled" as the result of living and doing business in a modern sky-scraper.

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At St. Augustine's Church, Elkridge Landing, a suburb of Baltimore, a mortar-eating bug is reported to have been discovered by the parish priest, Rev. Francis P. Doory. The priest noticed that the brickwork and marble facing, back of the altar, were falling to pieces and that the entire altar seemed to be in danger of collapse. He promply called in some workmen, who discovered that the cement binding the marble to the brick had been eaten away. With the removal of the first slab a multitude of cobite bugs were disclosed, hundreds of which were captured. Placed in a pail with several pounds of the dried mortar the bugs proceeded to devour what appeared to be their natural food, thus definitely establishing their destructive powers. These bugs are said to be a new thing to the naturalist, and scientific investigation will be awaited with interest.

THE ARCHITECT BEFORE THE LAW.*

II.

By S. G. Archibald, Advocate.

Mr. President and Gentlemen:—

To-night I propose dealing with the questions of servitudes in general, and more especially of mitoyen walls, and with the question of risk, i.e., at whose risk is the building before acceptance by the proprietor? Upon whom does the loss fall if the building be destroyed by force majeure before delivery? Are the architect and builder deprived of their right to recover the value of the work already done?

The question of servitudes is perhaps not one which will appear so immediately practical nor interesting as that of the 10 year guarantee; at the same time it is one with which architects ought to have a good general acquaintance. As a matter of fact, I presume that in the daily practice of your profession you have acquired a sufficiently practical knowledge of the question. I propose to put into systematic form the general ideas upon the subject which form the basis of our law, and to cite cases from our jurisprudence, which have given practical application to these theories.

In the first place, what is a servtiude? A real servitude is a charge imposed upon one property for the benefit of another belonging to a different proprietor. From one point of view then a servitude implies a right, from another a charge. The property burdened with the servitude is called the serviant tenement; that which enjoys the right is called the dominant tenement.

While a servitude resembles an obligation in almost every particular, it differs from it in this respect, that it has to do with properties and not with individuals. The right and the charge pass with the properties. The individual may be discharged from an obligation upon the payment of a certain sum of money, but the proprietor of the serviant tenement cannot liberate himself from the servitude by offering to pay its value in money. It is in realty a sort of dismemberment of property so far as the serviant tenement is concerned, and, so far as the dominant tenement is concerned it is a sort of quality in the property which forms part of it, and which the owner cannot be obliged to sell. Thus, for example, if there is a right of way in favour of my property across my neighbour's field, he cannot force me to forego my right by offering to indemnify me. If, however, my right of way has becnme, owing to cumstances, particularly burdensome, he can offer me another right of way over a different part of his property, and I will be obliged to accept it if the proposition is reasonable, and this will be a matter for the courts to decide.

It, of course, goes without saying, that the proprietor of the dominant tenement may sell or otherwise give up the servitude which exists in favor of his property, and, in such case, neither property will be affected with the servitude for the future.

No servitude can be acquired except by title, as the French maxim has it, "nulle servitude sans titre." It is not possible, therefore, to prescribe a right of way even by making use of i for 30 years. There must be some definite title establishing the right invoked.

There are 3 classes of servitudes: (1). Those derived from the natural situation of the properties called natural servitudes. Such, for example, as the obligation of a lower land to receive the natural fall of water from land above it.

(2). Servitudes established by the law, or legal servitudes. Such, for example, as the obligation to contribute to the erection of a mitoyen wall.

(3). Servitudes established by the act of man.

The distinction between the first two is only a distinction of words, because both classes are servitudes sanctioned by the law, and which exist independently of the will of the individual proprietor. Servitudes are really, therefore, those imposed by law and those which the individual chooses to place upon his property, and, as a matter of fact, these latter are the only ones which can strictly be called **servitudes**, because they are the only ones which really derogate from the state of **legal** liberty in which all property is a servitude, being a modification of property can only fairly be applied to those modifications made n respect of a particular property by the act of man. Our code, nowever, makes the division of servitudes into the classes just mentioned, and we must adhere to that division.

Under the head of natural servitudes the code treats of the obligation to receive waters from a higher level, of boundaries, and of fences. While we have no time to take up these questions in detail, it may be remarked "en passant" that the proprietor of the higher land has no right to aggravate the servitude in any way. Thus, for example, the Privy Council in the case of Frechette v La Compagnie Manufacturer de St. Hyacinthe (9 App. Cas. 170) decided that the proprietor of land occupying a higher level who had constructed works whose effect was to accumulate the water and to deepen the channel by which the water passed to the neighbouring land, had aggravated the servitude. Numerous other cases might also be cited forbidding any such aggravation. With respect to "bomage," this may be demanded at any time, and the right to make such demand is imprescribable. The cost of making a bomage is borne equally by the parties, with the exception that the cost of measuring is borne proportionately. Needless to remark, if legal contestation arise in fixing the boundary, the costs are borne by the losing party.

While the right to demand a bomage is imprescribable, it cannot be exercised arbitrarily, and the law in Art. 941 C. C. P. lays dowo the only cases in which it may be demanded. Where a legal bomage has been demanded, the surveyor makes his report, and the Court then, by its judgment, establishes what the line between the properties shall be. The parties have a right to be heard upon the surveyor's report, and no judgment, fixing boundaries, without a surveyor's report, and, upon which the parties have had a chance to be heard, is sound. Such is the jurisprudence of our courts.

First and most important among the legal servitudes is the obligation to contribute to the erection of mitoyen walls. In general we mean by mitoyenneté the co-ownership in indivision of an intermediate object serving as a boundary and as a separation between two contiguous properties, and especially a mitoyen wall is one which belongs in common undivided ownership to two owners whose properties it separates. Each owner has thus an equal and joint right in every part of the wall.

Mitoyenneté constitutes a community of property quite different in many respects from the ordinary community of property. It differs as to proof of it, as to its duration, as to its effects, and as to the manner of its acquisition.

As to proof, Arts 510, 511, C.C. give us a system specially adapted to it. They are as follows: (510) "Both in town and country, walls serving for separation between buildings up to the required heights, or between yards and gardens, and also between enclosed fields, are presumed to be common, if there be no title, mark, or other legal proof to the contrary." (511). "It a mark that a wall is not common when its summit is straight and plumb with the facing on one side, and on the other exhibits an inclined plane; and also when one side only has a coping, or mouldings, or corbels of stone, placed there in building the wall. In such cases the wall is deemed to belong exclusively to the proprietor on whose side are the eaves or the corbels and mouldings.

As to its duration. The ordinary rule regarding property is that no one can be compelled to remain in a state of undivided ownership. He can always put an end to the indivision by demanding a partition. In the case of a mitoyen wall neither party can demand a partition unless his neighbor consent. There is, then, only one means of ceasing to be undivided owner and that is the abandonment of the common wall.

Ordinarily, when two persons are owners in common of a certain thing neither party can make any change in it without the consent of the other. Not so, however, with respect to the mitoyen wall. Each party can can use it in such a way as to benefit himself, on condition only that he does not injure his neighbor in any particular. Thus, for example, he may build against the wall, he may place beams in it to within 4 inches of its thickness, and he may raise it, if such a proceeding is useful to him.

As to its acquisition. As a general rule no one can be compelled to sell his property save for purposes of public utility. This rule, however, suffers exception in the case of a wall separating two contiguous properties. He who has not contributed to its erection may acquire the common ownership of it by paying an indemnity composed of (1) half of the value of the land on which the wall is built, and half of the actual value of the wall or part of the wall of which the mitoyenneté is acquired. It is to be remarked that this right only exists in favor of the proprietor of the land immediately joining the wall, so that if A has left ever so small a strip of land between his wall and B's

* A series of lectures prepared for and delivered before the Province of Quebec Association of Architects, 1903, and published by permission.

property, B cannot acquire the mitoyenneté of the wall. This at least, is the opinion of the great majority of the French authors and of the Cour de Cassation in France, although there is a good deal to be said in favor of the contrary view. De minimis non curat lex—and if the strip be very small it might fairly be agreed that it should not be taken into consideration at all.

It goes without saying that the mitoyenneté in the wall must first be acquired before the neighbor acquiring it makes any construction upon it. Thus in a case of Joyce vs. Hart, decided in the Supreme Court (I. S. C. R. P. 371), the builder was condemned to demolish his construction built on a wall of which the mitoyenneté had not first been acquired. And in a case of Bruchesi vs. Desjardins (R.J.O. 2 C.S. page 436), it was decided that a neighbor can only acquire the mitoyenneté of a wall by conforming to Art. 518 C. C. which says, "Every owner of property adjoining a wall has the privilege of making it common in whole or in part by paying to the proprietor of the wall half the value of the part he wishes to render common, and half the value of the ground on which such wall is built," and when the wall in question is not straight and not proper to serve as a mitoyen wall the neighbor cannot without the consent of the owner or legal procedure take possession of the wall and demolish it, with a view to its construction as a mitoyen wall.

The question is sometimes asked as to whether or not a party who is building a wall which is not mitoyen can force his neighbor to allow him to take 9 inches of ground on his side of the line. There is no doubt that he can, but of course the neighbor will then have the right to acquire mitoyenneté in the wall on paying half of its actual value, and will have nothing to pay for land. It would always be prudent to notify the neighbor that you were taking advantage of your right to the 9 inches in order that he might oversee the work, if he so desired. A very interesting point has been raised as to whether one neighbor can take more than 9 inches of the other's ground when such is necessary for a footing course. The Court of Appeals in Keough and Lolin and in Rafter vs. Burland have seemed to deny that right. The Superior Court, however, in the last case upon the subject (Roy vs. Strubbe) has held that he could. This case has gone to appeal and is not yet decided. The reasoning employed in favor of the proposition seems to be irrefutable, but the points must still be considered as unsettled until the Court of Appeals shall have passed upon the last case referred to.

Walls separating two buildings, or two yards, or two gardens or a yard and a garden are presumed to be mitoyen and our courts have held (McKenzie vs. Tétu 12 L.C.R. 257) that mitoyenneté is a legal presumption which throws the burden of proof upon the person objecting to it, and the objection can only be maintained by a title or by certain marks or by legal proof. Article 511 C.C. already cited, indicates what these marks are. Of course these marks must have been placed in the wall at time of its construction or if placed later the consent of the neighbor must be proved.

Legal proof of the non-mitoyenneté may always be made, the only question that then arises is, what is legal proof? Apart from documentary proof our law allows verbal evidence to be made in certain specified cases only, and oral testimony will not be admitted to show the consent of a neighbor to the erection or placing of a mitoyen wall (Leduc vs. McShane, 29, L.C.J., p. 56). Nor will it be admitted to show the necessity of the demolition of a wall, whichhad been torn down without its insufficiency having been determined upon a hearing of both parties. This point was recently decided in a case of Tait vs. Lamothe in the Court of Queen's Bench, and shows the necessity of never touching a mitoyen wall without proceeding regularly and in order.

Those who own a mitoyen wall are charged with its repair and reconstruction, and only by abandoning all interest in the wall can they rid themselves of this obligation. If, however, the co-proprietor, wishing to abandon, have placed a building against the mitoyen wall he can only abandon by tearing down that part of his building which rests upon the mitoyen wall. Certain authors are of opinion that in order to be rid of the obligation to repair and reconstruct a fence wall it would be necessary to abandon the whole of the property in question because this obligation is a legal servitude upon the property, and only by giving up all the property can one get rid of it.

The co-proprietor of a mitoyen wall is authorized to execute certain works and is forbidden to execute others.

1. He may build against the common wall.
2. Place beams in it to within 4 inches of its thickness.
3. Raise the common wall, upon paying an indemnity of 1/6 of the value of the superstructure.

In case the wall is not in a condition to support the superstructure, then he who wishes to raise it may demolish it and rebuild at his own cost, and if any additinnal thickness is required he must take the land on his own side. In this case, he will, of course, have no indemnity to pay for the superstructure. On the other hand the neighbor cannot complain of the inconvenience and sometimes serious loss and damage to which he may be put. Thus, for example, A may keep a restaurant, B his neighbor, wishes to raise the common wall, and for that purpose take it down and rebuild it more solidly. A cannot complain even though his restaurant is almost deserted on account of the dust, dirt and noise caused by B, so long as B proceeds with diligence and does what he reasonably can to mitigate the nuisance. This doctrine was laid down by the Court of Queen's Bench in a case of Lyman vs. Peck. (6 L.C.J., p. 214).

Art 517 C.C. provides for the acquisition of the joint ownership in the superstructure by paying half its cost.

Art 518 C.C. provides that a proprietor who wishes to acquire the joint ownership of the whole wall only pays half its value. He is thus in a better position than the man who was already joint owner of part of the wall. Most of the French authors, however, consider that when the superstructure is already old mitoyenneté in it may be acquired by paying half its value.

It has sometimes been debated whether or not Art. 514 and 515 gave a right which could be exercised upon simple notice to the neighbour or whether these cases did not fall into the general rule established by Art. 519, which says: "One neighbour cannot make any recess in the body of a common wall, nor can he apply or rest any work there without the consent of the other, or on his refusal, without having caused to be settled by experts the necessary means to prevent the new work from being injurious to the rights of the other."

There does not seem to me to be any room to doubt that Art. 519 should be followed. The neighbour's consent must be obtained, or experts must be called in to settle the necessary means to prevent the new work from being injurious to the rights of the other.

In the case of Stephens v Walker 6 L. N. p. 286, the court of appeals condemned a proprietor to restore to its former state a wall which he had partly pierced without the consent of the neighbour, and without following the procedure indicated in our article.

On the other hand neither of the neighbours can make any opening in the common wall of any sort whatever, without the consent of the other, and this consent is absolutely necessary, and no judicial decree can be obtained dispensing with it.

Articles 521 et Segg, deal with the question of different stories of a house, common ditches, hedges, trees growing on or near the line.

Article 532 deals with the distance or intermediate works required for certain structures.

Articles 533 et Segg. deal with the question of view on the property of a neighbour. One neighbour cannot, without the consent of the other, make in any common wall any window or opening whatever, even if it be made with fixed glass.

Article 534 provides what windows may be placed in a wall, not common, immediately adjoining the neighbour's property. In the case of Cadorette vs. St. Germain (R. J. Q. 4 c.s. 136), our courts held that windows, placed in a wall that was not common, immediately adjoining a neighbour's property, had to be furnished with window sashes (Scelles), and that it was not sufficient that they were simply nailed down. Direct views are only permitted at left from the line, while oblique views must be placed at 2 ft. This distance is measured from the outside surface of the wall, and if there is a balcony, from its outside line.

Oblique views are those obtained by openings in a wall which is perpendicular, or nearly so, to the line separating the two properties. While the question of view on a neighbour's property is a very simple one in theory, at the same time questions of a good deal of difficulty have presented themselves in practice. If, for example, there exist a mitoyen wall between the building which has windows overlooking the neighbour's property, what is the point from which the required distance should be calculated? Evidently it should be from the centre of the wall, but if the wall should not be mitoyen, the distance will be calculated from its outside edge. But what, if later on, the neighbour, exercising his right, acquires the common ownership in the wall? Must the proprietor then close his windows

which would then be within the prohibited distances? The answer would be no. A legal act cannot become illegal by reason of a posterior fact.

While the law speaks of adjoining properties, it does not mean to restrict the sense to properties immediately touching each other; and so if there were a narrow strip of ground less than 6 ft. wide, over which there was a right of view, this would not prevent the proprietor of the following piece of property from complaining of views placed at less than 6 ft. from his land. Logically the same rule would apply where two properties were separated by a public road less than 6 ft. wide. All of the authors, however, make an exception of this case.

In a case of Hotte vs. Fauteux R. J. Q. 5 B. R. 38, the question came up as to whether views could be established in a common passage when each of the neighbours had furnished half of the land required for such passage. In this particular instance the passage was 8 ft. wide, and each neighbour had furnished a strip of 4 ft. Under these circumstances the Court of Appeals decided that a servitude of right of way was created, and not a right of co-ownership, and that each neighbour remained owner of the strip of land which he had furnished. The openings being thus within four feet of the neighbour's property were ordered to be suppressed.

Again, supposing for example that the proprietor have placed in the wall, which is not common, such openings as the law allows him to place, and that later on his neighbour acquires the mitoyenneté of it, can he be forced to close these openings? The authors are divided upon the question, but it would seem fairer to consider that the neighbour acquiring common ownership should take the wall in the condition in which he finds it.

Servitudes established by the act of man.

These servitudes are divided into three classes:—

1. Urban and rural.
2. continuous and discontinuous.
3. Apparent and non-apparent.

Urban servitudes are those established for the use of buildings whereever situated. Rural servitudes are those established for the use of land.

Continuous servitudes are those which can be exercised without the actual intervention of man, such as rights of view, etc. Discontinuous servitudes are those which require the actual intervention of man for their exercise, such as rights of way, etc. Apparent servitudes are those which are manifest by external sign, such, for instance, as a right of way made apparent by a gateway.

In order that a servitude which is discontinuous and non-apparent shall be binding upon subsequent owners of the property, it must be registered in the registry office of the division in which the property is situated.

There is a good deal of jurisprudence upon this point inas much as the courts are called upon to appreciate questions of fact, thus for example it has been held that a right of way is rendered apparent by the existence of a gate in the fence which separated the dominant and servient tenements and consequently the registration of such right was not necessary. On the other hand, it has also been decided that a pipe, placed in the earth for conducting water, when it is covered with earth and especially when the earth itself is covered with snow, being non-apparent the servitude which might exist in respect of it is equally, at that moment non apparent. These questions, however, are matters of fact which must be left to the appreciation of the court.

Servitudes are established by express title or by what is called "Destination de père de famille." As we have seen, no servitude can be acquired without a title and the principle that the acquisition of a servitude cannot have possession for its basis has been affirmed in the Supreme Court as well as in our own Provincial Courts. (Jones vs. Fisher, 17 Sp. C.R. 513.)

Now what is meant by "Destination de pere de famille"? It may be defined thus, the disposition and arrangement that a proprietor makes and by reason of which one of the properties or a part of one property, is destined for the service of the other. So for example, if there were two houses belonging to the same proprietor, the drainage from one of which passed over the land occupied by the other, and later on these two houses fell into the hands of different heirs, there would be a servitude established in favor of one of these properties over the other to allow such drainage to pass off in the manner in which it had done when they both belonged to the same proprietor.

Two things then are necessary, possession of two properties by one proprietor, arrangement during possession and by that proprietor, which would constitute a servitude if the property belonged to two different owners. According to the old custom this "destination de pere de famille" is equivalent to title."

Generally speaking the establishment of a servitude implies the concession of all that is necessary to put it to practical use. Thus for example a servitude of drawing water would carry with it an implied right of way. So also the owner of the dominant tenement would have the right to make, even upon the property of the servient tenement, all works necessary for its exercise and preservation, while on the other hand the proprietor of the servient tenement must do nothing which might tend to diminish the use of the servitude or render it more inconvenient; the owner of the dominant tenement must on his part do nothing which would aggravate it.

The question of diminution or aggravation of a servitude is one of fact to be determined by the courts.

Servitudes become extinct by confusion, that is to say, when one and the same person becomes owner of both the dominant and servient tenements. It is evident that a man cannot have a servitude over his own property.

Non usage for 30 years will also bring about the extinction of the servitude. In respect of discontinuous servitudes having need for their exercise of the actual intervention of man, so soon as this intervention ceases there is non usage, so that the 30 years would begin to run from this last exercise of the servitude.

As to continuous servitudes whose existence is independent of the intervention of man inaction could not constitute non usage. There must be an act contrary to the exercise of the servitude, that is to say, which would place the servient tenement in a condition of liberty. For example the servitude of right of view would not be interrupted by the fact that you kept your windows closed for it consists in the existence of these very windows. But if, on the other hand, you filled in your windows or if your neighbor built a wall which completely obstructed the view, then there would be non usage and consequently extinction of the servitude if you allowed this state of affairs to continue for 30 years without action on your part.

RISK.

The second part of our subject to-night deals with "Risk". It is hardly necessary for me to point out how important this question is from a practical point of view. For example in case the thing be destroyed before acceptance by the master, upon whom does the loss fall, or if the master become insolvent before completion of the work, in what position is his estate, or if the master were married while a building destined for him was in course of erection, does such building fall into the community or not?

The articles of our code which deal with the subject are 1683-4-5-6-7. The general maxim of law which must govern all questions under these articles is this "Res perit domino", that is to say a thing perishes for the owner. Whoever was the owner of any particular thing at the time of its destruction must suffer its loss. This rule, of course, does not deprive the owner of his recourse against him who caused the loss, if fault is attributable to him. Now article 1684 says:—

(1684.) "If the workman furnish the materials, and the work is to be perfected and delivered as a whole, at a fixed price, the loss of the thing, in any manner whatsoever, before delivery, falls upon himself, unless the loss is caused by the fault of the owner or he is in default of receiving the thing."

This is practically a sale of the thing subject to verification by the owner It is a sale of a thing to be made—consequently the sale of a future thing and so a conditional sale. The sale is made under the condition that the object which will be presented by the workman will be properly made. This condition is fulfilled when the thing is verified and accepted by the master. From this moment the risk of loss falls upon the master and not upon the workman. While the code speaks of "Delivery" the authors are agreed that verification and acceptation are all that is necessary and that after that, the workman holds the thing for the account of the master.

If the master be in default to receive it the risk also falls on him, as he has prevented the happening of the condition, because article 1084 C. C. says that a conditional obligation becomes absolute, when the party bound under the condition prevents the fulfillment of it.

Articles 1685-1686 say:—

(1685.) "If the workman furnish only labor and skill, the loss of the thing before delivery does not fall upon him unless it is caused by his fault."

(1686.) "In the case of the last preceding article, if the work is to be perfected and delivered as a whole and the thing perish before the work has been received, and without the owner being in default of receiving it, the workman cannot claim his wages, although he be without fault; unless the thing has perished by reason of defect in the materials, or by the fault of the owner.

When therefore the master furnishes the materials, then cases arise, (1) The thing perishes by the fault of the workman—he will owe its value to the master and may be held in damages. (2) The things perishes by fortuitous event—the master loses his materials and the workman loses his work. (3) The thing perishes through a defect in material, the master loses his material, but the workman has a right to be paid the price of his work. We must, however, make an exception to this rule, of the case

where the workman by reason of his profession should have known of the defect in the material and should have notified the proprietor. Such for example would be the case of a builder employing defective timber where he should have known better.

Could the workman claim the price of his work done at the moment of the loss of the thing? Yes, if the accident happened after the work was accepted by the master. No, if the loss occured before acceptance. Those who support this doctrine say that the workman has only a right to be paid in so far as the work was well done and that since the thing has perished, the verification of this fact has become impossible. It is urged also that this solution is only an application of the maxim "Res perit domino", that the workman is still owner of his work until it has been accepted. He has not only promised his work, but he has promised to make it so as to be received, that is to say to deliver it to the master. Until such time he is owner of it and consequently loses it, if the thing perish.

This is the position taken by the commentators of the Code Napoleon. The commissioners who drew up our code, after careful thought, adopted textually the articles of the Code Napoleon. At the same time they have not indicated them as being new law. Now there is no possible doubt that the Roman Law and Pothier did not adopt such a solution. The Roman Law and our old law before the code, was in the sense that if the work was such that it should have been accepted, then the master must suffer the loss of the materials, and pay the price of the work. The proof of the work being well done would be on the workman, but if he could make such proof he was to be paid. Such was the law before the code. It has been urged that our codifiers intended to reproduce that law. Under the strict wording of Art 1686 and in view of the fact that it has been taken textually from the Code Napoleon, I do not see how we can do otherwise than accept it as being our law, and consequently reject the solution of the Roman Law and the old law. We have been dealing hitherto with moveables, we come now to the more important question of immoveables. Do articles 1684 and 1686 apply to Architects and Builders? Are they included in the term "workman?" In the cases which we have been discussing does the architect lose the value of his services and the builder his materials and labor? As is natural upon so important a question there is diversity of opinion.

The Roman Law considered that where the owner furnished the land, whatever was built on the land acceded to it and became his property by right of accession. They therefore applied the maxim, 'Res perit domino,' 'a thing perishes for the owner,' and concluded that the owner must suffer the loss of the materials which had gone into the building and must pay the builder according to the work done. This also seems to have been the view taken by the old law before the Code. Pothier, treating of this subject says, "Supposing I have made a contract with an architect to build me a house on my property, for which he is to furnish the material. So fast as the building is erected it becomes an accessory of my ground. All that results from the work of the architect, the materials furnished and the form given to them belongs to me by right of accession. The loss is consequently mine, if it perish accidentally. The commentators of the Code Napoleon have considered that these articles were equally applicable to architects and builders, and that until the building was accepted its loss fell upon them. There is no valid reason for excluding architects and builders from their provisions, and even if you did do so you would still fall under the general rule, 'res perit domino,' and then if you considered the builder still the owner of the materials until their reception, the loss would be his.

It is said in answer to the argument that the materials accede to the soil, and consequently belong to the proprietor by right of accession, that accession is not accomplished against the will of the proprietor, and that these materials are only conditionally his property, and cannot be at his risk. La Cour de Cassation, the highest court in France, has adopted the reasoning, and, so far as the Code Napoleon is concerned, such seems undoubtedly to be the law. As a matter of fact, both the Roman law and the French law have exactly the same point of departure in the maxim 'res perit domino,' the effect, however, which they have each given to it has been different. The Roman law found the owner in the master, by right of accession. The French law found the owner in the workman, by right of an implied contract by which the master only became owner after the work had been received by him, thus seeing an intention in the parties to override the general principle of accession.

Has our code adopted the solution of the Code Napoleon? We have seen that it has adopted the exact wording of its text, and it would seem to me that unless we can find some very good reason in the codifier's report for believing that they did not intend such to be the solution under our code, that we must take it as it stands and join hands with the French authors.

An examination of the codifier's report makes it perfectly plain that they did so intend to adopt the Code Napoleon.

We are therefore forced to the conclusion that the building is at the risk of the builder until its acceptation, or until the owner is in default to receive it. The principles governing the contract of lease and hire of work apply, and not those governing the right of accession.

Two cases recently decided by our Court of King's Bench leave no doubt upon the point. I refer to the case of Murphy v Forget and Lessard v Shallow. In both these cases the court decided that these articles apply to architects and builders. They adopt the Code Napoleon and say that the contract is governed not by the rules of accession but by those governing the contract of lonage d'ouvrage.

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Ochre has frequently been recommended as a primer for use under subsequent coats of white lead. While it has undoubtedly the property of holding fast to wood itself, it does not hold as well to the white lead coats, which sometimes separate from it in flakes. This could probably be avoided by the addition of a certain proportion of white lead to the ochre for the priming coat.

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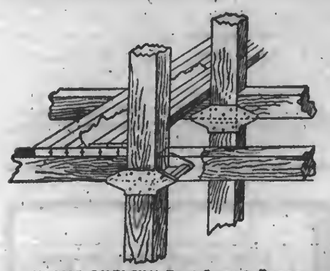
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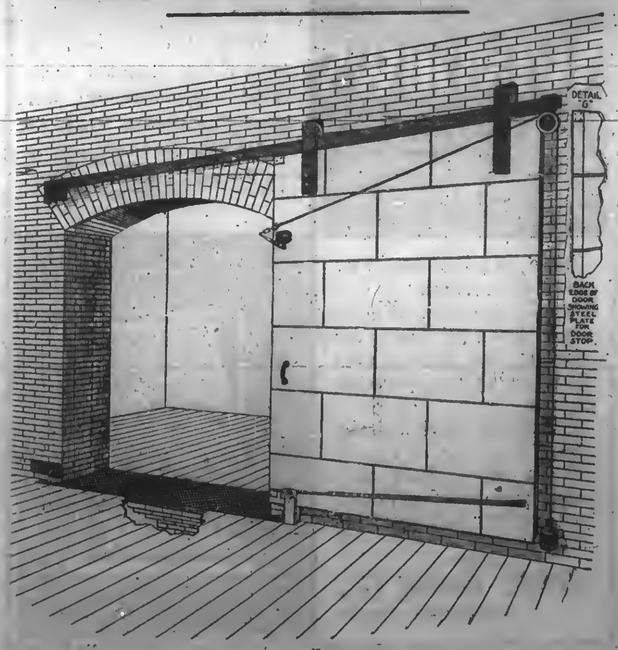

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NEW YORK, June 7th, 1904

To the Editor of the CANADIAN ARCHITECT AND BUILDER.

DEAR SIR,—As a means of justifying ourselves and correcting a false impression, we would ask you to publish this letter in a conspicuous place in your magazine.

There appears to have been circulated in Montreal a false, as well as unjust and spiteful rumor as to our standing and methods of doing business. This is evidently the result either of a row between two parties who agreed to act in conjunction as our agents there, or else the result of a spiteful feeling on the part of one of the above mentioned individuals, because of our having refused to continue business relations after our experience with his firm on the subject of payment of duties and delivering in which they were guilty of gross errors and misrepresentations too serious to cite.

We are not interested in family rows, nor do we care to slap back, for we might be able to hit too hard; but we want it thoroughly understood in Montreal in particular and Canada in general.

1st.—That we were the first to show American goods in our line, could be sold and delivered with eminent satisfaction to the Canadian market, and ours in particular, cheaper and better than any others.

2nd.—That we are in the Canadian market to stay, and to prove to the best builders and architects that we are A1 in finance, ability, delivery and product, and the right kind of people to deal with. We refer to a wide and long range of architects and builders during ten years active work, a list of which will be furnished on application.

In Montreal we are now represented by T. A. Morrison & Company; in Toronto by our old friends J. D. Macdonell & Company, both representatives of the best the trade offers.

Extensive photos of past work in detail, in album form, a practical and technical catalogue; samples and prices; and a printed and classified list of users of over ten million of our brick in the States; and a stock-list of brick, close up to two million are ready to be placed at the disposal of Canadian architects or builders who wish to be convinced of our standing. We invite inspection of our Canadian deliveries as compared with those of other manufacturers, including English and Scotch.

Very truly yours,

AMERICAN ENAMELLED BRICK & TILE CO.

J. Francis Booraem, Mgr.

SOURCES OF HEAT.

Faraday calculated that the average amount of heat radiated in a day on each acre of ground in the latitude of London is equal to that which would be produced by the combustion of sixty sacks of coal.

The heat of our globe is termed terrestrial heat. The layer of constant annual temperature is the limit to which the solar heat can penetrate below a certain internal layer. Its depth varies in different parts of the globe; at Paris, it is about 30 yards with a constant temperature of 11.8° C.

The temperature increases below the layer of constant temperature at the rate of 1° C for every 90 feet on the average. The greatest increase is at Irkutak, in Siberia, where it is 1° for 20 feet, and the lowest is in the mines at Mansfield, England, about 1° C. for 330 feet. This central heat is confirmed by the existence of hot springs and volcanoes.

To account for the existence of this central heat, various hypotheses have been proposed. The one usually adopted by physicists is that the earth was originally in a liquid state in consequence of the high temperature and that by radiation, the surface was gradually solidified, so as to form a solid crust.—Engineering Review.

Fire at Tyndall, Man., recently destroyed the engine shed of Gunn & Co.'s quarry, also the switching locomotive used in connection.

NOTES.

Water was first brought into London dwelling houses by lead pipes in 1582, by Peter Morris, a Dutchman.

Two Canadian patents for fireproof construction have recently been granted. The main feature of one is a network of wires or rods, fastened with hooks to supporting beams, and covered with a reticulated material; concrete is then placed on top of the beams, rods and this material, and above that are placed alternate layers of felt paper and insulating material, and the floor is laid on top of them. The other patent consists of a fireproof tower containing ventilating shafts, in connection with a system of water-pipes arranged in the ventilating shafts and within recesses in the floor of the building. Other inventions are a device for removing shingles and a tiled flooring.

The Japenese houses extend from the magnificent types of towers known as 'pagodas' to the plain dwelling. Some of these dwellings, however, are exceedingly elaborate in structure, the tile roofing often being highly colored. The coloring materials are made into the clay stuffs at the works, and the color is therefore fixed and lasting, even under the influences of the sun and the rains. Many of the low buildings are erected with an unusually rigid framework, which is built in with the clay cubes, bricks and tilework. The 'cage' construction of house building is followed quite closely, and one sees many a little Japanese habitation, in which the tiny apartments are erected with heavy walls, very clumsy and thick but essentially substantial. Much of the timber work is round, and the connections are with mortise joints pinned together. The roof is trussed and commonly tiled.

FIRE-PROOF GLASS WINDOWS

THAT ARE FIRE-PROOF

These windows in a fire-proof building, complete the security, and in any building will thoroughly prevent the spread and advancement of the fiercest flames.

Better than iron shutters (even if they happened to be closed at the needed time); fire-proof glass remains intact, resisting both the intense heat of the fire and the action of water.

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Used in conjunction with our hollow sheet-metal frames and other fire-proof fittings, it gives the most perfect protection available

It's adoption lessens insurance rates.

If you want to know more about "fire-proof windows," write us, it's an interesting subject.

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TORONTO. LIMITED,

MAIN CORRIDOR, CITY HALL, TORONTO

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER.

A Corner at McGill University, Montreal
Sketch by "Gargoyle"

A Passage in the Falkland Palace, Scotland
John Knecross, R.S.G., Architect

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
JUNE, 1904.

HOUSE IN CRESCENT ROAD, TORONTO

SPROATT & ROLPH, ARCHITECTS

OLD BUILDING, MONTREAL
SKETCH BY "GARGOYLE"

The Canadian Architect and Builder

VOL. XVII.—NO. 199. JULY, 1904.

ILLUSTRATIONS ON SHEETS.

Residence of W. D. Lummis, Bedford Road, Toronto.—J. W. Siddall, Architect.
Interior New Bank of Montreal Building, Montreal.—McKim, Meade & White and Taylor, Hogle & Davis, Architects.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Tower Room, Colchester Town Hall, Colchester, England.
Proposed New Building for the Central Canada Loan & Savings Company, Toronto,—Sproatt & Rolph, Architects.

CONTENTS

Editorial	113-114	Causes of a New York Building Failure	125
The Architectural Association and its Work	115	List of British Firms Wanting Canadian Agents	127
By the Way	116	Plasterer's Prices	127-128
The Selection of Colors	116	Brickwork and Stone Facing	ix
Northwest Notes	117-118	The Use of Steel in American Lofty Building Construction	x
Montreal Letter	119	Plaster Surfaces	xi
The Architect and the Garden	120-121	Business Notes	xii
Plumbers' Work, Past and Present	122-123-124		

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A Hint About Planning.

A weak point in the planning of perhaps the majority of modern houses will be found to be the arrangement of the top or "attic" storey. These upper storey rooms might be made both comfortable and attractive, if they were given due consideration by the architect. As a rule they either do not seem to receive the attention to which they are entitled, or are sacrificed for the sake of exterior effect.

Compulsory Ventilation.

The Legislature of the state of New York at its last session passed a bill providing for the ventilation of public buildings and having particular application to school buildings. This is the first comprehensive measure for the purpose yet adopted in the United States. In seventeen States, however, laws have been passed which require expert examinations of plans for projected school buildings and provide for fire scapes and other means of protection from fire.

The Architect and the Contractor.

The production of a satisfactory building requires the best efforts of both architect and contractor. The architect needs the sympathetic co-operation of the contractor, and to this end should seek to maintain harmonious relations. The honest, intelligent contractor—and there are thousands such—is, in his field of effort, as important a man as is the architect in his. He is therefore entitled to be treated by the architect with courtesy and respect. Unfortunately some architects, possessed of an undue sense of their own importance, are in the habit of treating contractors in a most arbitrary and discourteous manner. In the west, where the democratic feeling is strong, an eastern architect who assumed this offensive manner was promptly taken to task by a prominent contractor and in unmistakeable language told that such treatment would not be tolerated. Where contractors show a disposition to evade the strict terms of their agreements, the architect is justified in being severe, and indeed will show wisdom by refusing to have any further dealings with a contractor who has forfeited his confidence. But with the honest contractor the "high and mighty" air is unjustifiable, besides being calculated to bring the architect and his authority into disrespect and stand in the way of the successful working out of his designs.

The Union Label on Buildings.

In proposing that all buildings erected by union labor should be labelled, the National Building Trades Council submit as a reason the following:—"The union label on a building will be a testimonial that the men who erected the building are thorough mechanics earning fair wages, and thus enabled to benefit the community as consumers. It will be the

best guarantee that the building is safe, substantial and in a sanitary condition." The contention here made is not capable of proof, and is advanced in the hope that it may serve to obscure the real object in view. While it is doubtless true that a majority of the most skilled workmen may be found in the union ranks, it is by no means the fact that none but good workmen are admitted. There are thousands of incompetent workmen belonging to the unions, and conversely, there are many first-class mechanics who are non-unionists. Hence it follows that the employment of only union labor is not in itself a guarantee of good workmanship. One of the most serious and well-founded complaints preferred against unionism is that it has done nothing to raise the standard of workmanship, but on the contrary seeks to place all mechanics on one level, disregarding the widely differing abilities with which the Creator has endowed them.

Uniform Cement Specifications.

Official or quasi-official specifications governing the character of cement for construction work have been adopted in Germany, France, Sweden, Switzerland and Russia. An attempt to standardize specifications is now being made in England, where, at present, as in Canada, specifications vary widely even where the nature of the work and the conditions are identical. According to a recent writer on this subject some English cement specifications call for 300 lbs. per square inch on the neat briquette after 28 days; others demand 550 lbs. after 7 days. Not only are different specifications inconsistent with one another (assuming that the architects and engineers who drew them were anxious to obtain good cement) but they often themselves contain paragraphs mutually inconsistent. Such for instance, as finely ground cement with an extreme weight per bushel. Some time ago, says the writer, an engineer drew up an elaborate document giving, amongst other things, the size of the sieve wires. Upon investigation it was found that had the sizes he specified been adopted the cement would have had to find its way through a solid brass plate. As we have previously pointed out the extensive use which is already being made of cement in construction and the certainty of its employment on a still more extended scale in the future demands not only properly drawn specifications, but also a system of testing all cement, in order that the safety and durability of structures built largely or entirely of this material may be assured.

Only the Best is Wanted

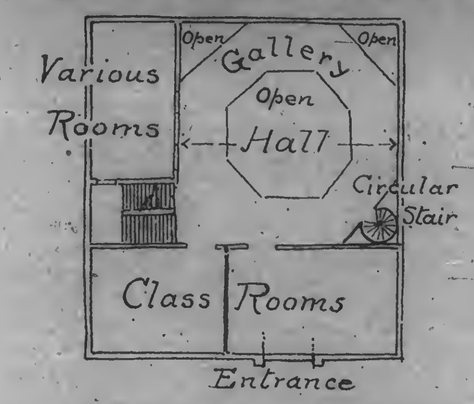
Manufacturing methods have greatly improved in recent years. The production by enterprising firms of goods possessing not only high quality but artistic design and pleasing appearance, has created a demand on the part of purchasers which cannot be met by the manufacturer who seeks to stand by old methods and styles. The manufacturer who is not prepared to bring his goods up to the highest standard in every particular had better retire from the field, and not wait to be forced out by his more enterprising competitors. Some manufacturers enter upon the manufacture of a certain line of goods as a side line to what they regard as their principal business. This side line fails to receive the careful attention and push that is given to the other departments of the business and in consequence drags along in a lifeless sort of way, the goods produced being regarded with disfavor, and failing to hold their own in the market. In perhaps no other direction has there been greater progress than in the production of materials adapted for use in the construction and furnishing of modern buildings. A remarkable improvement is manifest in our modern Canadian architecture, more particularly our houses. The new requirements make constant calls upon the manufacturer for new and improved materials. Whether his business be to make bricks, radiators, plumbing goods, or the thousand and one other materials used in modern buildings, he can only hope to succeed by keeping his goods in point of qual- and appearance thoroughly abreast of modern requirements.

The Relation of Science to Architecture.

In a recent paper before the architectural Association of London, Mr. A. E. Munby urges the necessity of giving the study of science a larger place in the education of architectural students. He reminds us that the modern building and its equipment involves many scientific features and problems with which architects in the past had not deal but with which the modern architect must be familiar. There are also constantly being brought forward scientific inventions for use in bnildings upon the merits of which the architect should be competent to decide. Mr. Munby points out that if the architect has not the scientific knowledge to enable him to do this, or having the knowledge, shows indifference to such attempts in the direction of progress, it ought not to cause wonder or complaint that the tide, stemmed by his apathy, finds new outlets, and that the public place in other hands matters which should pass through his hands alone. The author quotes the saying of Ruskin that "Every work of art either states a true thing or adorns a serviceable one," as proof that there is no conflict between art and science. After showing some of the most important applications to architecture, he concludes by suggesting that a passage through the following courses should form part of the requirements of an architectural student at the outset of his career: (1) A general experimental course on physics, including laboratory work and dealing with the dynamics of solids and fluids, with heat, magnetism and electricity, and very briefly with acoustics and optics; (2) A similar course dealing with the elements of inorganic chemistry, touching upon principles, but chiefly of a descriptive character. Mere analysis to be subordinated to simple quantitative work and the preparation of important compounds. The illustrations of chemical laws being based, as far as possible, upon those substances which would afterwards figure in a course of applied chemistry; (3) A short course outlining the principles of geology, and dealing with the stratigraphical arrangement of rocks and with petrology rather than with palaontology, and aided by the examination of museum specimens, and by occasional visits to quarries. The paper contains a table showing the hours per week devoted to science in the Architectural Courses in a number of Universities in Europe and America. At the head of the list stands McGill University of Montreal, with a total average of 79 or 30½ per cent. of the student's acadamic career devoted to science and its applications.

THE ARCHITECTURAL ASSOCIATION AND ITS WORK.

A visit to the new building of the Architectural Association showed that they are doing real work, worth studying. Their new quarters are in the building of the Royal Architectural Museum at Westminster which, with the architectural casts it contained, was handed over to the Association about a year ago; and the Association have, in the meantime, spent over $40,000 in altering and adding to the building, to fit it for their use. The result is a building composed of three divisions, each containing one set of the Association requirements, and a staircase in an angle between them.



There is first, for the disposition of the casts of the architectural museum, a hall about 50 feet square and three stories high, open to a skylight but with a ten-foot gallery running round it at the floor levels. On a third side are the staircase and a small block of rooms for general purposes—a dining or common room with serving room attached, the master's room, a coat room, lavatories, etc., and the front, which is four storeys high, is taken up with the library rooms and the secretary's room on the ground floor at the entrance and three floors of class or lecture rooms above. The two top floors are each divided into two class rooms; one floor for the day school, the other for the evening school, each of which consist of two classes. The first floor is divisible into three rooms by means of folding partitions or can be opened up into one large hall about 70 feet long and 24 feet wide.

So much for the habitation. The works are numerous. What concerns us most is the school work. There are three divisions: the Day School, the Evening School and the School of Design.

The Day School. This school which begins its year on September 28th and ends it on July 16th, has three terms of twelve weeks each with hour from 9.45 a.m. to 5 p.m. The fee is 15 guineas a term ($228.70 a year) for the first year and 10 guineas a term ($152.50 a year) for the second year. There is a master, who directs and attends to give lectures, and two assistants who are always in attendance. The subject matter of the teaching is the elements of construction and design. There are two years. The first year is preliminary to articles, intended to give the student a standing of some usefulness when he first enters an office, and to fit him to understand better and learn more rapidly from the work he will see going on about him. The second year is taken in connection with office work; a certain portion of his time during his first year in articles being allowed the student for school work.

In the first year all the ground is covered, in both history and construction. The master gives a lecture a week in each subject and the rest of the time is occupied by drawing under the direction of the demonstrator. The following is an outline of the work:—

Construction is taught by means of visits to buildings in course of erection. It does not require many visits in a term, for the subdivisions of elementary construction when spread over three terms, do not give too much to think of at one time. The subject is divided as follows: First term, Foundations, Brickwork and Masonry; second term, Timber and Metal Construction; third term, Roof Coverings, Plumbing (which is English for flashing and flat work, as the work is usually done in lead), Plastering, Joinery and Finishing. The method of teaching is to first explain construction on a building, with examples before the students of the points under consideration, and then to set papers to find out how much they have learned as a guide to further lectures. Drawing goes on concurrently with lectures, and there is a blackboard upon which the students are encouraged to study details full size. A case of models comes into use in the last term when joinery and other finish is under consideration. By that time the drawing has reached the stage of application, still however only by means of copying drawings. Drawings of a cottage are supplied for study and imitation; large and small scale drawings and full sizes are drawn, traced, printed and colored, and specifications are written, exactly as would be required in an office. The year's work in the study of Construction thus brings the students into touch with actual draughtsman's work.

On the side of History there is outside work to be done both on buildings and, for the earlier stages especially, in museums; but drawings play the principal part. Beginning with the Orders, the students proceed, during the first term, to the study of a large Roman plan, exemplified by the Baths of Caracalla, photographs of which in its existing state and a drawing of its conjectoral restoration hang on the walls to help them to realize the building. Roman basilicas wooden roofed and vaulted conclude the the first term's work and prepare for the second which is occupied with vaulted buildings—a plan section and elevation of a Byzantine and a Romanesque church and a couple of bays of an early-French vaulted refectory. In the third term the students work through the more elaborate Gothic vaulting to the Renaissance, which they study in English examples. Lectures in the meantime go on, keeping pace in subject with the period of the drawing in hand, and the object of the lectures is not so much to carry on the same line of instruction as is given by drawings as to give an account of the history of the period and cast light on the manners and conditions of life which gave rise to the style of building under consideration at the moment on the drawing boards.

During the first year there is also given some instruction in measuring old work, and the Easter vacation of a month is supposed to produce a study of this kind; for which opportunities of such work with prizes and rewards, offered later in the students' career as members of the Association, give sufficient inducement.

At the end of this year's work a student should be fairly qualified, in point of both construction and de-

sign, to be useful in an office and to learn from office work. There is also a chance that, without spending more than a year over it, he will discover that he is not fitted for such work at all. Unless this discovery is made, he is supposed, on the conclusion of the first year of the Day School, to enter into articles with an architect for an apprenticeship of five years. This is usually done at once; and in the autumn he resumes work in the Day School, which in this year is limited to two days a week.

The work of the second year consists entirely of working out problems in design from specified conditions. There are no lectures; instruction is given by criticism. The distinction between the work done by this class and that of the studios and Sketch Clubs for more advanced students, with which we have some acquaintance in Canada, lies in the motive. It is a first principle of the training for an art that the mind should not be led beyond the hand, and there is no attempt made in this class to develop individual invention; the intention is rather to make the design merely a vehicle for working into form what the students have learned in their previous year's study of the History of Architecture. It is one thing to be familiar with detached features of historical design, or even to draw them in place, and another to understand or remember their characteristics well enough to apply them in work of one's own composition; and the problems worked out in this class serve to clinch the student's knowledge of style by giving them experience of its practical application. The library of the Association furnishes them with the means of accurate study so that there is no reason why they should not, between study and criticism, build up a design which is scholarly and yet original in the sense that they have made the knowledge which it represents their own. The great divisions of style receive equal attention so that no bias is acquired in the school towards one more than another. Construction is represented by a domestic problem or two of a simple nature for which drawings and specifications sufficient for contract are made.

This ends the work of the Day School. To carry his learning farther the student must attend the Evening School intended for pupils who have passed their first year and have to spend all their time during the day in an office.

It will be necessary to take the space of a second article to give an account of this and the other proceedings of the Association.

W. A. LANGTON.

THE SELECTION OF COLORS.

The following table will be found useful in choosing the various tints, inasmuch as by examining them in the order here given the eye will at once detect the slightest difference of shade. To refresh the eye

Look at	Greens	before choosing	Reds.
"	Blues	" "	Oranges.
"	Violets	" "	Yellows.
"	Reds	" "	Greens.
"	Oranges	" "	Blues.
"	Yellows	" "	Violets.
"	Tints	" "	Browns.
"	Browns	" "	Tints.

Steel tapes are graduated in feet and tenths, and pocket tapes to hundredths of a foot.

BY THE WAY.

In the tower of the Central Methodist church on Bloor street east, Toronto, now in process of demolition, hung for half a century or more the town bell of Yorkville, now included in that part of Toronto lying north of Bloor street. The bell has been temporarily taken down but will again be mounted in the new tower of the reconstructed church.

× × ×

It is reported that the Treasury Department at Washington is about to issue an order prohibiting draughtsmen in the employ of the Government from making drawings for outside firms. It is estimated that fully one-half of the 150 draughtsmen employed in the office of the supervising architect of the Treasury give their services after hours to outside employment, and this it is held interferes with their efficiency in the Government service. This practice has also prevailed in Canada, and has been the cause of protest from architects in private practice who felt that they were being subjected to unfair competition.

× × ×

A Japanese house is the simplest thing in the world, says a writer in the Western Architect, consisting as it does of a post at each corner and a roof. One may say it is all on one floor. And in the daytime it is all one room, if it is a small house. The number of bedrooms in it depends on the number of bedrooms the ower requires. They are divided by night by paper shutters fixed in grooves like the divisions of an old-fashioned workbox. There are no doors or passages. Your bedroom acts as a passage, and when you want a door you slide back the nearest panel. Two sets of shutters go around the outside. These outside shutters cannot be slid in the same promiscuous fashion as the other. Each is held in its place by the next and the last one is secured with a bolt of wood. There are plenty of Japanese houses which when secured for the night would hardly stand a drunken man leaning against them. An Englishman's house may be his castle—a Japanese house is his bedroom, and his bedroom a passage.

× × ×

There died at Philadelphia recently a wealthy stone merchant, William Gray, who was at one time well known in Bruce and Huron. In 1871 he came to Canada and settled near Iverhuron, in Bruce Township. There he was known as Boss Gray, and there he carried on extensive operations. On the second concession of this township he bought a farm of two hundred acres, and built a great stone castle. A fine avenue, bordered by spreading trees upon either side, led up to the magnificent residence. The house was richly and elaborately furnished. In each room mirrors ran from floor to ceiling. There were grand stairways. There were broad and spacious halls. There were wide, open fireplaces. In every room the generosity and the luxury of wealth was artistically exhibited. But it was occupied for only two years, and ever since the rats have run riot through its splendid chambers. When the family left the house the rich furnishings were left behind. Nothing was disturbed, nothing removed. The house has seemed to stand through all these years waiting for the family to come home. But lately the bedding and the curtains dropped to pieces and decay was upon all within the mansion. Grass and weeds possessed the wide avenue, the trees were ragged with neglect, and the gate sagged upon its hinges.

NORTHWEST NOTES

Branch Office of THE CANADIAN ARCHITECT AND BUILDER,
310 McIntyre Block, WINNIPEG, July 14, 1904.

The progress of the many building propositions continues apace. Contractors on every hand are making the most of the excellent run of fine weather we have recently had, and had it been possible to have obtained a full supply of materials, greater headway would have been made and much more satisfaction to all sections of the community have resulted. As it is, however, building operations are sadly in arrears of the positive necessities of the immediate demands. Offices, warehouses and dwellings are alike pressing their needs to the front and vying with one another for first attention.

Office space in any desirable location is almost impossible to obtain, and in the event of any office being vacated plenty of occupants are readily forthcoming, and rents are consequently going up with leaps and bounds. The conveniences, too, of many of these buildings are sadly deficient, and no attempt is being made to give attention to the many modern and necessary improvements which in most other cities are considered part and parcel of an office equipment.

The new Union Bank Building, which is now well on in its construction, is looked to as providing a decided relief in both these respects. Besides placing at disposal a large number of additional offices, it will also have the advantage of being thoroughly up-to-date, and on this account many firms have secured space and are leaving offices which they have occupied for a great while, and the inconveniences of which have had to be endured.

We should judge there never was a better opportunity than the present for experienced and enterprising men to make capital for themselves and at the same time confer a distinct benefit on the hundreds of business firms which are looking to the West for development of their commerce, by the erection of buildings of the most modern type and adapted to the conditions prevalent in the district. And this would apply not only to the class of buildings just mentioned, but to all buildings for which there is a demand. There is clearly manifest on every hand a great tendency to erect buildings sadly deficient in their details of construction and finish. The mad rush of buyers has brought on the market a number of men whose sole endeavor is to get a building together at as little cost as possible, even though it be at the sacrifice of, what should be, necessary details, the number of people seeking dwellings making it an easy matter to secure purchasers. It is true many of these men are "small" men, and act as their own architects, but the real injury is certainly not minimized on that account, but rather increased, as they have neither the reputation of the architect at stake, nor the stability of a sound builder to fall back upon.

"A straw will show which way the wind blows," and there are already whispers that the capitalists are beginning to limit their advances on certain classes of properties and in order to complete sales builders have had to take certain risks on the mortgage—a clear indication that present values are questionable.

The foregoing remarks will, of course, apply more particularly to houses built expressly for sale, but inasmuch as the prosperity of Winnipeg has come to stay, it is of the first importance to see that its buildings are such as will become a sound investment and not a source of trouble.

There is really no reason why there should be any difficulty in this respect. Winnipeg possesses at the present time as competent a staff of architects and contractors as could be desired; it would therefore be an easy matter for a prospective buyer to obtain a concise and accurate report of any building, from a man of professional repute, for a charge that would be infinitesimal compared to the immense advantage of such a certificate. At the present time, however, it would appear that all these necessary precautions are at a discount—so great has been the boom, and so eager the purchaser, that their best interests have been neglected.

The need of a precaution of this nature becomes the more apparent when the fact is taken into consideration that the "by-law" which governs the erection of buildings is considered to be of a most unsatisfactory nature, leaving as it does the interpretation of what a "foundation" really is according to the by-law as uncertain and vague as it could well be, so that the unscrupulous builder can steer well within the letter and still miss the real benefits which it is meant to confer, and the evils it was intended to remove. As long as he lays a simple stone or cement footing upon which to erect his structure, he is well within the "by-law," the question of going deep enough to strike the solid blue clay being left entirely to the discretion or whim of the builder himself. And this too within the protected limits of the city.

In our last issue we pointed out one of the peculiarities of the soil here in this city, and with this before the mind it can easily be seen the great danger that exists where a proper solid foundation is not reached.

A man building for his own holding will, of course, be amply protected by his architect, and there is little danger in that case; but for the buyer from a speculative builder a certificate from a professional man becomes an absolute necessary precaution.

We understand that a revised by-law is under consideration which will fully meet this unsatisfactory condition, but in the meantime property is being rushed forward, and too great care cannot be exercised in a thorough examination before purchasing.

We note with satisfaction that the authorities are doing all in their power under the present by-law to secure the stability of all new buildings, within the First and Second limits, and are also extending such limits from time to time as occasion requires, thus giving the greatest protection possible to the city proper.

The "First" limit practically includes the whole of the business centre, whilst the "Second" limit comprises the residential section immediately adjoining.

Buildings within the "first" limit are required to be either stone, solid brick, or iron throughout.

Buildings within the "second" limit must be either brick-veneer, metal-clad, or rough-cast.

All roofs in both limits to be of "incombustible" materials or shingles laid in "half inch" of lime mortar.

As an indication of the proportions reached by the enormous influx of population, it might be instructive to note the prices recently reached in real estate values, as compared to those prevailing within a reasonable time.

In the west part of the city, a district which is fast gaining in popularity as a residential section, small plots which last autumn could have been readily bought for $350 have recently changed hands at $550. This is in part owing to the belief that it is at this point that the G.T.R. is likely to locate itself.

In the south advances have been even more marked, the city having pushed out in that direction in a decided manner, and also on account of the close proximity of two public parks. Here the values have risen from $50 per foot to $100 within the twelve months.

In the city proper the advances have been beyond all expectations; property which could not move an offer at $380 per foot last year, has recently been sold at $1,000 per foot. This in itself may be a special instance, but at the same time it is quite reasonable to fix the average advance at an easy 75 per cent. over last year.

A distinctive mark of Winnipeg and one which gives it its character is its essentially "commercial" aspect. The many buildings which are rising up on every hand carry with them the clear lines of warehouses or stores, and present somewhat of a contrast to the heavy factory buildings of many other cities. It is a "commercial" city more of necessity than of design, and there are few, if any, natural advantages which would warrant the supposition that it would ever become a manufacturing centre of any importance. It can easily be seen, therefore, that it is

peculiarly dependent upon outside resources for its supply, and should there arise any cause of interruption in the prompt delivery of those supplies the effect becomes immediately apparent, and the results more serious than otherwise would be the case. In this connection the "freight conditions" of Winnipeg are causing a good deal of dissatisfaction, trade being seriously checked by the uncertainty and delay in delivery of goods. This probably is nowhere more marked than in the building trades, where the scarcity of materials has been causing the greatest anxiety. Many buildings have had to be held in abeyance, and others seriously delayed in their progress entirely for lack of supplies; it is computed that, had there been sufficient materials ready to hand, there would have been an increase of quite 25 per cent. in the completed buildings during the present season; this, in a city where the dearth of available dwellings stands already at almost the famine point, is of most serious moment.

It is without doubt that the present year's progress came as a general surprise; all expected a measure of advancement, but no one looked for such strides as have actually come to pass. The financial section, at the commencement of the year, were inclined to move with caution in face of last year's anticipations not being fully realized, and probably this re-acted on the business men, causing them to hold back many orders which should have gone forward, thus causing a certain amount of delay in commencing operations. The difficulties at the present, however, are more distinctly those of "transit." From all accounts it would appear as though it was high time that a change was made in the handling of merchandise, so that there was some certainty of receiving a consignment of goods within a reasonable time, instead of having to wait and often suspend operations, the only news obtainable being that "the goods cannot be traced." If such a state of things continues, with the present extensive operations under way, it is impossible to tell where it will land us, and a serious check to business will result.

The extensive alterations and improvements to the Exhibition grounds are now rapidly nearing completion, but for some time it seemed as though the buildings could never be finished in time, mainly from the cause already referred to, but by dint of great exertion after much waiting, the work has gone ahead, and will be ready to keep the schedule time.

The tremendous storm which swept over the city some weeks since did a great deal of damage to buildings and property, more especially in the outlying suburbs, and to the smaller new dwellings under construction. In several instances houses were removed several feet from their positions, but without otherwise receiving damage; many simply collapsed with the severity of the wind and a long stretch of sheds on the railroad siding were razed to the ground. On the new Union Bank building work had to be at once suspended owing to the effect of the electricity on the steel work.

If one required additional proof of the real advancement of the city, it could well be found in the excitement prevailing in the community toward the improvement and enlargement of church buildings; there are quite a number in project, and many new ones under consideration. This probably is one of the best indexes to the substantial and financial success of the city; seeing that the churches are to a great extent not only the expression of the religious sentiments of the populace, but also the indication of their social life and progress. On River avenue, Augustine Presbyterian church is nearing completion and will be a fine stone structure in Gothic style, with a seating capacity of upwards of 1100. The Wesleyan church on Juno and William streets is to be improved and the capacity about doubled. The First Baptist church on Hargrave is to have an extensive addition and the seating capacity will be increased by about one-third.

The extension of the city and opening up of new streets and avenues have made it necessary to arrange for a better supply of fire stations. The authorities have therefore derided to erect five new buildings, one on each of the following streets, Sherbrooke, Gertrude, Burrows and McDermott. The plans have been prepared by Messrs. Melville Bros.

The Winnipeg Builders' Exchange held their monthly meeting on Tuesday, the 5th inst. The meeting was a most enthusiastic one and many interesting topics were discussed, a resolution being passed to the effect that each section was to be called together, a permanent chairman appointed, and the arrangements of the section kept in thorough order, preparatory to the adoption of important measures in the interest of the members.

THE BRICK OF WINNIPEG.

The brick supply of Winnipeg is fast becoming a serious proposition. For several months past the greatest difficulty has been experienced in obtaining sufficient to keep work in progress; in point of fact this has been the case since the opening of the season. Work commenced with a short supply and it has been impossible to catch up to the demand. The local brick fields in operation have proved quite inadequate to meet the constantly increasing demand.

There are some ten or twelve brick-yards in full work, carrying some twelve pug mills, and these working at their full capacity produce scarcely 800,000 bricks per day, a total which is greatly insufficient to meet the demand of the building enterprises now on hand, the daily consumption at the present time being probably four times that number.

We understand that several of the largest contracts were originally arranged for Manitoba brick, and it was not until it was found impossible to get a supply on this side that imported brick was resorted to.

In the north end of the city, where a number of small buildings are being erected, the difficulties of obtaining a supply of brick were met in a somewhat novel way. In this district are resident a number of Doukhobors and Italians, and in order to keep up the necessary supply, a gang of these men set to work to collect the clay and mud dug out of the excavations for cellars and foundations, from which they made brick in the crudest and simplest way possible, without recourse to machinery of any kind whatever. The mixing of the clay was accomplished with the naked feet, and the moulding done by hand, the bricks being spread out on the ground to dry, afterwards being stacked in rough kiln fashion in the cellars from which the mud was dug and there baked for use. In this way they have not merely succeeded in keeping enough for foundation work, but have made sufficient to complete a small hotel throughout, for their own local use. The bricks made were at first much larger than usual, and the novelty was by no means reduced in watching the bricks being laid, the workman having to lay down his trowel each time and take up the brick with both hands. It certainly speaks well for the adaptability of these settlers, who had probably never made a brick before in their lives.

The brick in favor in this district is the common white clay brick, and one for which the local clay is particularly suitable. It stands the severe climate remarkably well, and in time gets as hard as stone. However, the clay from which it is made seldom runs at a greater depth than a few feet, and thus makes it a necessity to frequently shift location, a circumstance which prevents the brick-yards from adopting many of the more modern systems, which would probably increase the output.

We understand, too, that at a much greater depth a good supply of fine blue clay can be struck in certain localities, but up to the present it does not appear to have attracted attention, the general disposition being to pass on and keep near the surface.

Last season closed leaving no stock on hand and it looks at present as though this season will close with work standing still for need of brick.

WINNIPEG STONE MASONS AND THEIR DIFFICULTIES.

The present condition of the stone industry cannot by any means be considered satisfactory in Winnipeg and the surrounding districts, not on account of lack in trade prospects, for as for these the possibilities are certainly without limit.

The general rule favoured by Winnipeg architects is to make provision for "native" stone on all heavy buildings, and also on all dwellings of a substantial character, up to the first or second floor lines. This in itself means the absorption of a quantity of stone, mostly of a general and uniform character, so that there would appear to be no valid reason why the production of these blocks should not be continued without any interruption and at a rate which would keep pace with the advancing conditions of the city. Considering, too, that there appears to be ample supply to draw upon, and from all accounts plenty of men to considerably increase the output, it seems the more to be regretted that the present unsatisfactory conditions prevail.

The new Public Library which is well under construction and which should be finished by September next, is one of the greatest sufferers from deficient supply. It is to be almost a stone building throughout, and it is found impossible under present arrangements to obtain sufficient to keep the work going ahead; instead therefore of being "finished" within the specified time, it will be as much as the contractors can do to get the walls and roof up by the time now fixed for finishing.

Other buildings, too, are like sufferers, and perhaps of more importance because of their business character. In every case it means hindrance and check to trade.

It is of significance, as showing the natural result which follows the undue suppression of an industry, that many buildings are being erected in which "terra cotta" is being used in place of stone facings, and on enquiry it is found that this is mainly on account of the impossibility to get stone with any moral probability of having sufficient to complete the building within a reasonable time. The only thing to be done in order to be certain of securing progress is to use a substitute.

In discussing this subject we are approaching one which has underneath the surface a problem which is likely to affect, not merely Winnipeg, but any and every district within the limits of the confederation of the workmen's union. It is therefore well, and we think opportune, to present the dangers which face the forcing of issues on lines at present assumed by the men's union. The common experience of all trades, and we think it should be palpable to the simplest intellect, is that as surely as day follows night, so surely must machinery supplant the simple methods of hand labour. A very short review of any trade or factory which has made headway with any rapidity must convince the most sceptical that the introduction of machinery acts as an incentive and opens up possibilities of extension which would never have been dreamed of under the old conditions, and thus increases instead of decreases the employment of labour.

In opposing the introduction of additional machinery, we think it should be quite clear that the stone workers are really placing a serious obstacle to the advancement of their own industry, as well as hindering the employment of many more men, and probably limiting their own earnings. There could not be a better illustration of this than the present season in Winnipeg. The quantity of stone used could have easily been doubled had it been possible to have obtained it, whereas substitutes have been used from the other side, and money which could have been kept in Canada passed over the border.

Further, and perhaps what is more to the point from a workman's standpoint, is the serious effect on the wage earning capacity which inevitably follows the suppression of any industry, and this is what is really done by refusing machinery—the wage earner being the inevitable sufferer, the substitute which gains the field usually reducing the demand to the lowest possible point.

Right here on the spot one of our leading firms have new and improved machinery set down ready for use at great expense, and they are obliged to let it remain idle or face the question of a strike of men. From every point of view this is much to be deplored, as it really seems to the advantage of all parties interested to place the industry on a footing that will keep it on a par with the progress of kindred trades.

This question is, we understand, one of the principal ones for discussion at the forthcoming conference of the confederated unions at St. Louis, and we hope it will end in a manner to commend universal approval.

MONTREAL NOTES.

No. IV.

The gargoyle's ghost flapped his scaly wings disconsolately and scratched a pointed ear with a well armed left claw. They had set him high on a minster tower in Yorkshire four long centuries ago and more, and he had a taste for noble architecture hammered into him with the blows of the mall which had taught him how to grin and bear wind and weather and keep his tail neatly curled against the cornice on which he lived and to be a proper gargoyle.

When an easterly gale upset the old lead spire he had guarded so long he was involved in the ruin and so his spirit had left the broken fragments of his body in the market place far below and had been blown across the seas even to Montreal, where, finding a congenial atmosphere of thin smoke riven by many steeples he sought a spot on which to rest which might remind him of his former life.

But the sense of fitness and proportion in matters architectural which long connection with a stately pile had bred in his stony heart made it difficult for him to settle down. Zinc parapets gave even to this ghost of a gargoyle a violent sense of insecurity. Often he espied afar off what promised him some semblance of gothic comfort but on closer inspection these turned out to be but hollow shams and faked hypocrisies.

Once in his old life he had heard two students of architecture who had measured him up along with the tower where he dwelt, speak of the glories of the gargoyles of Notre Dame at Paris, and hearing that there was a church of that name he sought it out, hoping to find stony brethren to haunt. But from the bleak desolation of that building he fled dismayed.

Now the gargoyle knew that it was the end and object of his being to praise and magnify the Lord in his own little way, just as it was the purpose of the minster, from which he had fallen, to do so. Thus finding a city with many denominations possessing many building none of which he could conceive of as contributing to the praise and magnification of anyone, he concluded that he had come to a land wherein the Lord is not praised; and as he was only a gargoyle he must make allowance for so grossly unreasonable a deduction. That was why he flapped his wings and scratched his ear in the Place d'Armes on the morning of July 12th, 1904, and here begins the adventure.

Opposite the church he had left was a great and spacious portico and in the centre a door, and devoutly preoccupied men were ascending the steps and entering in. Quoth the Gargoyle's ghost, "Is this also a temple of the Most High?" Being inquisitive though sceptical on the matter he followed the crowd. Now inside the door there were building operations in progress and the Gargoyle's ghost thought "how assiduous are these worshippers entering with serious mein thus early in the morning a building not yet completed." By this time he knew that they were worshippers indeed.

As he passed the inner door a great glory struck his eyes. The floor was white and the ceiling was white and the walls were white, and before him was a row of great shining green granite columns with brazen caps and the bases were of jet black stone and beyond these were more columns yet taller and nobler and a wide space with great windows on the further side. And it took the breath of the Gargoyle's ghost away from him and he hid behind a pillar. But presently he had courage enough to examine the jointing of the stone and the hewer's work and such little matters as he had heard the masons who set him in his place talk of and he found all as it should be and conningly wrought beyond belief.

Then noting that the worshippers stopped not, neither bowed down, he followed boldly on into the great hall. And had he come in by a window he had been annihilated on the spot, so goodly was the place and so full of great majesty, but coming as he did from the proper entrance he experienced only a sense of fine exhiliration which was as the master builders had intended it should be with one entering.

The columns were taller than those without and the caps more wonderfully wrought and the cool rich green of the Vermont granite contrasted nobly with the gilding on the caps. The roof they bore aloft was coffered and embellished with fine gold wrought with a beauty beyond belief, for had not those self same patterns been used by men for 3,000 years and more, and had not all the experience of that long time been brought to bear in proportioning them each to his use and place. And the ghost of the gargoyle knew that "scale is everything," for there had been a big discussion whether 10 or 4 feathers would look best on his wings, and the latter had been decided on. His wings were all right he knew.

The piers of the walls were of Tennesee marble, tooled and not polished, and the color was very tender, and there were panels in the walls of red plaster, and the gargoyle's ghost did not like them at first but when he considered how finely they contrasted with all the other elements of that building he knew that they too were right.

And an altar of green Italian serpentine inlaid with red Belgian marble ran from one end of the Temple to the other and the length of the great hall of the temple was 172 feet and the width 84 feet and height was 56 feet. On the edge of the altar there was a screen of bronze cunningly cast and finished and there was no flaw anywhere and the ghost of the gargoyle wondered and said, "Although this temple is not dedicated to the praise of the Lord, he whom they worship here is a very great power and exactness and precision are of the quality of his perfection."

The priests of that temple sat behind the screen and busied themselves with the offices of the temple and ministered to the people, and he could make nothing of it, for the worship was a real one but unlike anything that had ever taken place at the minster and been discussed by the gargoyles there.

So the ghost of the gargoyle lingered till he was satisfied that it was here that the men of Montreal did their real worship and he concluded that the God must be very great to be worthy of so fine a temple and the devotion of the Montrealers in erecting so noble a pile to his honor touched the heart of the gargoyle.

So he went his way and lodged in a pine on the top of the mountain and considered what it all meant, but of two things only could he be at all certain: First, that the temple was very fair and enduring, and secondly, that what the men of Montreal worshipped in the great hall behind the portico that is opposite to the church of Notre Dame is the chief god of the land and that it is therefore right and proper that his temple should far outshine in splendor and glory any building to the Lord of the old minster.

Yet Gargoyle

THE ARCHITECT AND THE GARDEN.*

The intimate relationship between the house and the garden, and consequently between the house designer or architect and the garden, is almost entirely overlooked by or unknown to the general public. This ignorance may, perhaps, be due to the architect himself, who has in the past failed to make use of opportunities when called in to design a new home or to alter an old one. Architects, as a body, have failed to study garden craft and design, or to realize how great is the connection between house and garden from both the practical and æsthetic point of view. But interest is being aroused, both amongst the public and the profession, in this, to me, most fascinating branch of our art, and it behoves us to be fully prepared with reasons why the architect's jurisdiction should extend to the garden, and to see that our knowledge is founded upon sound principles.

I do not propose to go much into the question of the right or wrong in garden design. I would rather dare to paraphrase Kipling and say, "There are nine and sixty ways of constructing" garden lays, and every single one of them is "right"—so long as we keep before us the spirit of the old English garden, and understand the principles which underlay its formation and development. Perhaps, at the outset, I had better say what I personally conceive those underlying principles to be.

First of all, then, seclusion. For if this was not the great aim of the old gardeners, it is an end which has certainly been attained. The brick wall with its green crusted coping, the close-clipped hedge, defying the prying eyes of the curious, high trellis-work with its entwining creepers, all point to this end, and while serving the useful purpose of giving shelter to fruit and flower, wrap the whole garden with a tranquil air of seclusion, security, and mystery. This was well understood in the seventeenth century, and is, I think, clearly the reason why Georgian houses were so often placed close to the road in order to give more space and seclusion to the gardens lying behind them.

After seclusion comes usefulness. Gardens were not made merely for pleasure, but to provide the home with necessities and delicacies elsewhere unattainable. Fruit growing was a fine art. The bakehouse, brewhouse, game larder, fishpond, dovecot, herb garden, walled fruit garden, orchard, quincuna, and stillroom were necessities, and not merely evolved out of playful fancy. Then there is, I think, no doubt that the fishpond or tank owed its origin in mediæval Catholic England to the demand for fish. The old-fashioned herb garden too must not be forgotten. The culture and curving of "simples" was formerly part of a lady's education, and gardens were ofttimes renowned for this feature alone. There was also the necessity for good, dry paths and terraces, for it was in the garden that exercise was largely taken, roads being few and bad. The garden was therefore an integral part of the home—indeed, an absolute necessity—for, if the household was not self-supporting, it could barely exist. Thus garden and house grew up and were designed together, for each was the complement of the other.

The next question is—Do these principles still hold good; are the same necessities still in existence; can we, after making all due allowance for the lapse of centuries and rapid growth of modern requirements, still say that the same factors should form the basis of good garden design in this twentieth century, and, if so, how is the architect thereby affected? A little consideration will, I think, show that in reality almost all the old conditions should apply at the present time.

First, seclusion. The greater number of houses, and the greater chances of being overlooked by near neighbours, serve to make strongly defined boundaries, which will act as screens, even more imperative than ever, and thus we have ample excuse for "high-walled gardens green and old," hedges thick and trim, and well-designed trellis as bounding lines.

Of the usefulness and necessity of a garden the need is still the same, though perhaps at first sight not so apparent because the reasons are more psychological than materialistic. Fruit and vegetables can probably be bought from the greengrocer as cheaply as they can be produced in most private gardens, but the demand for them is greater than ever. Jam and pickle factories have done away with the absolute necessity for home growing, but I think everyone will agree that home-made jams are far superior. I am sure that few people realize how much can be done and how much pleasure obtained from even a limited number of well-cared-for fruit trees, and what is more beautiful than an apple or pear orchard either in early summer or autumn? Then, too, there are many trees such as mulberry, quince, medlar, cherry plum, filbert, which, while full of delight to the eye, are useful as well. These planted with discernment will give pleasure to generations. Without going quite as far as Voltaire's "Candide" and saying, "Let us cultivate our garden, for that comprises the whole duty of man," I am certain that if nowadays gardening, not merely flower gardening, but honest fruit and vegetable growing, with the accompanying culinary knowledge, was better understood and followed we should hear less of broken nerves and jaded energies. There is no recreation more healthful than gardening, and health is the ground plan of all that is worth having in life. Then, too, there is its educational influence, especially upon children; and there is no better way of teaching scientific truths and imparting a true system of observation of nature than by means of the well-ordered garden. Of the joy of the "pleasure garden" there can be no doubt, and, surely, we should be able to appreciate this part of the garden, and derive moral and physical good from it as much as our ancestors. . . . . The house and garden still require each other to make the home one perfect whole. Each must fit in with the other, and each must be in most cases subject to some special circumstance of site and locality.

Who, then, is so fitted to bring this about as the man who designs the house? He must have a hand in the laying out of the garden, or full advantage of the site may be lost, and so the chance of welding together house and garden through some happy accident of nature may be missed for ever. How can we convince our clients that one mind should control the two? The end can only be achieved by taking our client (or more often his wife) with us. If he is a careful man, or anxious of expense, it may be well to approach the garden from the materialistic point of view. Point out the desirability of determining where surplus earth may be removed at one hauling, and thus save labour and form your broad lines all in once. The making of paths from old material may be suggested, or the position of the carriage drive if the house is to have one. If by some such means the ice can be broken then, perhaps the rest may be plain sailing. If the man or woman has any real love of the garden, out it will come, and the resulting garden should express not so much your individuality, but the owner's directed by a trained mind, but still expressing, and that, too, decidedly, the owner's particular quips and cranks. . . . Before, however, the architect can scheme anything, there are certain facts he must know. First comes the question of garden labour. He must ascertain exactly what amount of labour will be kept, for upon this hangs in reality the whole scheme. It is suicidal to design a garden which requires the time of four men to keep it in proper order if only two are to be kept. It will always look untidy, and the owner will never feel satisfied, and will blame the designer, who assumed a responsibility without due knowledge.

The chief charm of a real garden is, I think, shown in the care which is taken of it. If the turf verges are shaggy and ill-kept the charm of line is gone, and the feeling of love and care which should be induced will be wanting. I know a garden, and I say garden advisedly, which is only some 16 ft. by 20 ft., and yet year in and year out it is the pride of a village, and that solely by reason of the love and care bestowed on it by its cottage owner. I know also gardens which are gardens in name only because they are too ambitious for the staff. . . . Some excellent practical advice on the subject of garden labour is given in Mr. Mawson's "Art and Craft of Garden Making," but the best way of arriving at a reasonable judgment is to carry in our minds some garden or gardens we know well and the number of men who are employed, comparing the results obtained with the size of the garden and using our knowledge with designing.

Having discussed preliminaries and discovered the trend of our client's garden mind—if, fortunately, he has one—the choice of the actual position and aspect of the house will largely depend upon the result arrived at. For instance, we might choose a level site for a lawn to avoid expense in moving earth, and the position thus chosen might affect the house considerably. It is often far better to take old meadow turf in hand rather than to sow afresh, especially where time is an object, for turfing and sowing can only be done at certain seasons, viz., spring and autumn, and then the the result depends largely upon weather, which is chance. Nothing so makes or mars the appearance of a garden as good or bad turf. Generally some characteristic of the country side or natural feature on site, which may lend itself to our gain, can be seized upon, and may influence or modify both house and garden, proving how essential it is that the architect should have the necessary knowledge to turn the accidental peculiarities of the site to the best advantage.

It must not be forgotten that in almost all gardens there is a chance and opportunity—indeed, a necessity—for some architectural features which it is essential the architect should design or control. It is here that the modern garden designer and horticulturist necessarily fails. He has not had, in most cases, the requisite architectural training, and not having designed the house, he perforce loses that sympathetic link in detail which the architect would impart. The old gardens were full of architecture, and such buildings as tool-houses, potting-sheds, root-houses, stone steps and balustrades, summer-houses, dove-cots, seats, and thoughtful trellis work were features in them. Such are required still, and, if used with restraint, will help to add human interest. But the necessity for them should be the keynote. Do not let us introduce them simply to make "features." If a seat is desired it will work its way into the design, and by its presence, add to the garden's beauty. The sun-dial, though apparently no longer a necessity (in these Grimthorpian days), is most fascinating, and, if used rightly, will set our thoughts working and lend just that touch of romance which is needful to both eye and memory. Above all, let us keep garden architecture simple both in form and feeling. It is not what we put in so much as what is left out that sets the seal on the perfect garden. The old formal garden had almost degenerated into grotesqueness by the eighteenth century from over-elaboration. To be a garden designer, the architect must have a knowledge of garden craft. He must know and love the materials he has to deign with—namely, the flowers, grass, trees, and herbs, and must be fully alive to the fact that a garden is a living, growing thing.

So much has been said lately about gardens from the practical point of view that I will only refer briefly to this aspect of the subject.

First, then, soils and drainage. Obviously the latter depends upon the former, and until considerable practice has given us knowledge, I would suggest that we first of all ascertain what is the local custom as to treating the soil, and how much or how little drainage it requires. Mr. Mawson says that "unprepared soil is the cause of almost all garden failures." Secondly, we must discover what grows well in the neighbourhood, for it is no use designing and planting trees or boundaries which will only need replanting after some years.

Thirdly, botanical or horticultural knowledge. Without going very deeply into this question we must know something of the times and seasons at which the flowers we propose to use will make their richest appearance. We need not know the best way to make them grow, but may presume that will be done for us. Observation and a garden notebook will teach us much. Well-made, dry paths and walks are a practical necessity, for wheeling soon cuts them up unless the foundations have been well prepared. Fruit and flower gardens must have both sun and shelter, or plants will not grow, and early and late frosts will do a deal of unnecessary damage. The house-drainage scheme must not be overlooked, and advantage should be taken of all manurial products.

In effect, then, the burden of my paper is this: House and garden must be treated together, and be the product of one mind—the architect's. He may scheme his garden as he pleases so long as it is subordinated to the house, and he always keeps before him its fundamental uses and objects—seclusion, usefulness, and pleasure. . . .

* Summary of a paper by H. P. G. Maule, read before the Discussion Section of the British Architectural Association.

NOTES.

On March 12th last Judge Somerville, of the United States Board of General Appraisers, ruled in favor of the protest of Mr. Bohm, an architect of Indianapolis, against the assessment of 20 per cent. on certain drawings made by him in Europe.

A competition has been instituted to secure suitable plans for the buildings of the Carnegie Technical Schools, Pittsburg, Pa. Five leading architectural firms have been invited to submit designs in a limited competition, and will each be paid $1,000. The competition is open to all architects whom the Committee may invite. Five additional prizes of $1,000 each will be paid to the five architects whose designs stand highest in merit. Architects desiring to enter this competition are requested to provide the committee with information as to their professional work upon blanks to be had from Director Arthur A. Hamerschlag, 313 Sixth avenue, Pittsburg, Pa.

PLUMBERS' WORK, PAST AND PRESENT.*

By W. H. Allen,
Late Teacher of Plumbing, Cardiff Technical Schools.

It would certainly be interesting to consider, in the light of present-day practice, the methods adopted by the plumbers of old in the centuries that are gone, but in that case the subject of my paper should have been that of "Plumbers' Work, Ancient and Modern"; so for the purpose of setting out with a clear understanding of my intentions, I propose to confine my comparisons to those of my own experience and recollections during the past thirty years.

And to prevent misconceptions of any remarks that I may hereatter make, let it be understood that I propose dealing with the subject entirely from a plumber's point of view. By that I mean that, while I fully recognize and appreciate the many improvements that have taken place during the above period from a public health point of view, I look forward with pleasure to the discussion that will follow upon this proposition, viz. :—That the progress made has been prejudicial to the plumber as a craftsman, and that the whole of the benefits from such progress and improvements have been to the benefit of the public.

From a purely trade point of view, then, are these improvements to be regretted? In reply I would say, with all the emphasis possible, certainly not! If these improvements have made life any easier, or have added anything to the sum total of human happiness, we as plumbers have no right to regret that we as a trade have suffered; and considering how small a proportion we are of the people, we must stand aside, and if necessary "go to the wall," if by doing so we can in any way make those of our day and generation the better for it.

This gives rise to another thought :—Have we as a trade been fully alive to the fact that, owing to the more modern methods of manufacture, &c., the work to be done by the operative has been constantly reduced? Have we done all that we might have done to add other branches to our trade when we saw so many slipping away from us? My own opinion is that in this respect we have been somewhat lax, and we have only ourselves to blame for the position we now find ourselves in.

But I must not dwell upon this further, or my alloted time will be taken up before I approach the subject proper. I must therefore leave it with you for further elucidation in discussion.

ROOF WORK.

The first call upon the plumber in the construction of a building is when the roof is ready, and here we find a marked difference. Much lighter lead is used, and far less of it. We find valley tiles, hip and ridge tiles used in place of lead, and zinc has become a keen competitor with lead for valleys, gutters, bays and dormers. Parapet gutters, lead hips and ridges are practically a thing of the past—not that this can be attributable to the fault of the plumber or architect, but to the present-day demand for cheaply-built premises, also to the construction of concrete and asphalt flat roofs, which has removed the necessity for lead flats.

The old way of lining eaves gutters (made of wood) with lead, and rain-water down pipes made of lead, has been entirely superseded by the extensive use of cast-iron. Lead rain water heads, and the covering of finials, gargoyles, and other ornamental finishes, has been reduced to a minimum by the use of those made of cast-iron or terra-cotta. So that it will be seen that the quantity of plumbers' work in connection with the external work of a building has been very much reduced in the period I have mentioned.

WATER SUPPLY.

The question of how the building should be supplied with water is the next consideration.

To-day all we have to ask is "Where is the main?" and then to run our pipes from the prescribed point to the various fittings we have to supply. But it was not always so. In the days before the advent of constant supplies at a sufficiently high pressure, many things had to be taken into consideration, such as the method of supply, whether from some higher point by gravitation or from the more frequent source of wells. Was it to be an ordinary pmp or a lift and force pump? Was it to be a deep well pump, or was it to be supplied from rain-water storage tanks? Then the sizes and positions of the storage tanks, the rising main to them, the supply pipes from them—all this meant a great deal of work for the plumber, and in this connection the plumbers have been great losers, and the public have benefited materially.

When one realizes how difficult it is to-day to find work in a plumber's shop when work is quiet, one is forcibly reminded of the days that are gone. One can remember, when there was nothing else to go on with, the old story of, "Make up a few pumps," the burning up of the barrels, the fitting-in of copper chambers, making the spouts and the casting of the taper box-pieces; and how careful we were told to be when, as boys, we had to hold the iron bar in the sand mould, ready to swish it around, smartly and regularly, so as to get the box-pieces of an even thickness; and how, if it was successfully accomplished, our mate took all the praise, but when it turned out of uneven thickness, how the boys had to bear all the blame!

And, again, who does not remember, when the taper box-pieces were superseded by the spindle valve, how a quietness as still as death had to reign in the workshop while the valve was being fixed level in the tail pipe ready for wiping? The making of cup-leathers, the leathering of boxes, the casting and leathering of clacks—to say nothing of the sundry journeys to the blacksmith's to see if the iron work was ready—all this has gone never to return.

The young plumber of to-day can have no conception of the amount of work the plumber had to do in connection with deep well pumps, both of the long barrel pattern and the short barrel which are fixed in the wells; the fitting of the suction and rising main pipes, the fixing and repairing of the pumping gear, sometimes involving the use of many intricate cranks and cog wheels. This was always attended to by the plumbers. He was the mechanical engineer of these jobs, and the existence of such arrangements added considerably to the plumbers' work.

The change in internal fittings has been very marked also. Instead of the well-made H.P. taps that we have now, we then had to deal with plug taps made of the

*A paper read before the South Wales and Monmouthshire District Council for the National Registration of Plumbers.

diaphragm pattern; taps poor in design, often defective, and the plumber was called in to remedy the defects.

Baths were but rarely met with in the old days, owing to the difficulty nf getting the necessary water; and this, with the hot water services, perhaps is the only compensation plumbers have for the substitution of constant service supplies against that of pump supplied houses.

The old form of supplying baths in the best houses was that of the triple valve arrangement, by which means the hot and cold water was supplied through the waist outlet; and while condemning it from a sanitary point of view, it was the means of giving a lot of work to plumbers.

The present-day method of fitting up lavatories is far preferable to that of the old, which involved much more work in fixing the supply valves against the wall, with a breeching pipe and supply to arm of basin, and its putty or red lead joint. This is yet another instance showing how the work has been lessened.

Sinks and troughs, which were formerly lined with lead, have been replaced with copper, or more frequently with those of glazed fireclay.

Supply cisterns, which were formerly of lead, are now made of galvanized iron, or in some cases of copper and but very rarely of lead.

Who would have believed in the old days, when we were busily at work striking out and wiping up service boxes and fitting in the old bells or poppet valves in water-closet cisterns, that the day was coming when such work would be as extinct as the Dodo? Yet it has all gone. The lining of the cistero, the making of the service boxes and wiping them in meant more work for the plumber than the whole job of fitting up a closet does at the present time. To-day we have the cistern delivered at our shop doors, complete and ready for fixing, and either made of cast-iron or earthenware.

When the plumbers had to make their own soil pipes, bends and traps they could always depend upon having work to do in the shop, but no employer would to-day dream of letting his men make a soil pipe with its soldered seams, and the introduction of hydraulic presses has entirely superseded the making of such articles by hand labor. All this has tended to reduce the available amount of work to a minimum.

A marked change for the better has taken place respecting the methods of wiping. Well do I remember the first lesson given to the plumber's boy, viz., that of cooling the plumbing iron, the getting ready of the quench hook, the cooling of the handle so far up, the seing that the iron was not burnt, the filing off of the scales, and above all the correct way of handing the iron to your mate, as it had a nasty habit of falling back and touching you up. And after the great event of wiping was over, the care taken in picking up the bits of solder—for solder seemed more valuable then than it does to the boys of to-day.

Before treating with the question of water-closets I would like to refer to the making of the rightly-condemned old-fashioned D-trap, but we did not know of its bad character then.

One can remember the old set of patterns hung upon the wall of the shop, religiously preserved from generation to generation; the wiping in of the dip pipe, and the great care exercised in seeing that it was not too far down or too high up. These considerations involved a deal of care and thought on the part of the plumbers of those days.

But whatever fault we may find with the D-trap, we must all acknowledge that it was a nice job to be making them, and it was with regret we parted with them, and have only our recollections of them left.

The old pan closet has been anathematized over and over again, and I have not one good word to say of it, only that it was the means of providing work constantly for plumbers. In well ordered houses it was a standing job to take them out, and clean, black and re-tin the copper pan once every 12 months. So here again the public have benfitted at the expense of the trade.

The valve closet, and one maker's in particular, was a source of much work. How many will remember the patience required in dealing with the intricate regulators, and resisting the desire to drop one's "big hammer" through the pan! But these are going the way of the old pan closet, and are practically replaced by the more modern closets in earthenware.

The work of fitting up wire bells was formerly done by plumbers, and was a very important branch of the trade. To give you an idea of the comparative cost of the old-fashioned wire bells as against electric bells I will tell you of a case that has recently come before me.

An architect is about to build a gentleman's residence a few miles out of town, and he specifies that the bells are to be of the old-fashioned kind, with wires and cranks, &c. The fittings are to be supplied by a certain firm who make a specialty of this class of work, and upon asking them for a quotation for the material required, they very courteously informed me that they had already quoted several people for the work, and their price was £60. Now if this job was done with electric bells, many would be glad to get it at from £15 to £20.

I only refer to this as an illustration of the decline in this class of work, because it is the labour item that would be more reduced than that of material.

But this is not the worst part of it. When electric bells were first introduced, we, as a trade, failed to see "the sign of the times," and neglected to grasp this branch of the trade as we should have done.

I am speaking generally because I am aware that there are some few exceptions to this general statement; but nevertheless the majority of us failed to grasp it, and so we can add bellhanging to the "what might have beens." Not that it is too late even now to recover ourselves. I am sure that if we once realize the necessity for it, we will take full advantage, and receive our share, of a branch of the trade that is rapidly falling out of our hands and into the hands of electrical fitters.

I am perhaps laboring this question of bellhanging, but it is because I have experienced on the part of the plumbers a strongly rooted objection to have anything at all to do with electric bell work.

In recent years there has been a very serious decline in the gasfitting branch of the trade, so far as it concerns the plumbing trade generally, and it is due to two distinct causes—1st, that of the introduction of electric light; and 2nd, to that of the competition of gas companies.

Taking the latter first, what do we find? We find that, owing to the fact that the companies supply stoves on the hire system, this branch of the work has practically ceased to exist so far as the trade is concerned,

because no one would buy a stove out and out when they can hire so cheaply and so frequently exchange them. It is a matter of finance to the company. It pays them to let the stoves out at a nominal charge for the sake of the extra gas consumed. And now we know that the company will fit up a house with pipes and fittings free of charge, with a penny-in-the-slot meter—not from philanthropic motives, but because it means a greater consumption of gas. All these things, small though they may be in themselves, tend to reduce the work available for plumbers.

Now as to the lighting of premises electrically. Here again we missed our opportunity as a trade, and again I must qualify this general statement. There were a few (but even those were somewhat late in doing so) who endeavored to commandeer this branch, which was at the commencement legitimately ours, whatever it may be now. At that time the electrical fitter was not. He had to be made. There were none at that time, and we as plumbers should have mastered this work, and so prevented it from slipping out of our hands. Weether this branch can be recovered I an very doubtful, because I think the electrical specialists are too firmly established ; but I do not wish to discourage the attempt to do so that is being made by several members of the trade, and I feel assured that the result depends upon individual energy and enterprise. Whether we ought to stand aside and permit the electrician to monopolize the whole of this work is a matter of opinion that can be freely expressed by you in discussion.

Hot water work, or, as generally set out on the shop windows, "Heating Engineers." Why has this branch become specialized as it has of recent years? I know this is the day of specialization, but I do feel that we as a trade have ourselves to blame for some of it.

Perhaps it is hardly fair to put it that way either, in this case ; because we never heard of hot water engineers until the ironmongers got hold of the trade. In the old days the plumber had to do it all, and he was always ready to tackle any job that presented itself. But when the ironmongers were masters of the plumbers they employed, they had no respect for the success of the trade or the maintenance of its position. They employed anyone they liked to do the work, and so a distinct class of men has been created, now designated as "hot-water fitters," and to the detriment of the plumber.

Another important factor, too, must be considered, and that is the building of greenhouses and conservatories has developed into a special business. Firms undertake the whole of the work, inclusive of the heating work. So this branch has ceased to exist as an admitted branch of the plumber's trade.

It is assuredly worth our while to make every effort to get as much of this work as we can, and in passing permit me to suggest that we might, as a body of men deeply interested, spend more time together than we do in considering what means can be best adopted to regain our lost position, or, to put it another way, to secure as our legitimate work what should in all fairness belong to the plumber.

I think I have cited sufficient to prove a great diminution in the work of the plumber, notwithstanding the fact that the number engaged at the trade doubles itself every five or six years. And after the instances I have pointed out, which serve to show a great reduction in the available amount of work, you will ask how we have managed to live through it all?

Well, on the other side of the count we have to put the greatly increased number of houses fitted up with conveniences that would not have been done if the water supply was as it used to be. And again you must remember that we have been building new houses at a very rapid rate, and this new work has helped us. But we know it cannot always be so. Building operations have been severely checked of late years, and will probably be so for some time to come ; and it is when we have reached the limit of our building resources that the pinch will be felt so far as it relates to the work of the plumber.

It therefore behoves us to carefully examine our position, and to ask ourselves if we are doing all we can to establish an equilibrium, by taking up other work in the same ratio as we have lost it and are losing it. We can never return to the old order of things. The making of pumps and D-traps has gone, and can be buried as useless ; and in these days of progressive sanitation we would not, if we could, have them back again.

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In large centres like London, Glasgow, and other places, it may be that lead layers stick to that particular branch ; and inside or sanitary work might be done by another set of men. And so with the branches of gasfitting, bellhanging and heating. But in this district I know from experience how very much one branch depends upon another, and while the specialist of our trade might be inclined to smile and think I have made "a mountain out a mole-hill," I feel assured that many of you who are able to see the matter through my spectacles will consider that the peculiar conditions of the trade justify me in so including them.

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7	H	6	¾	10 10
8	J	6	¾	10 10
9	K	6	¾	10 10
10	L	6	¾	10 10
11	M	6	¾	10 10
12	N	6	¾	10 10
Hight to under side of roof beams				144 2

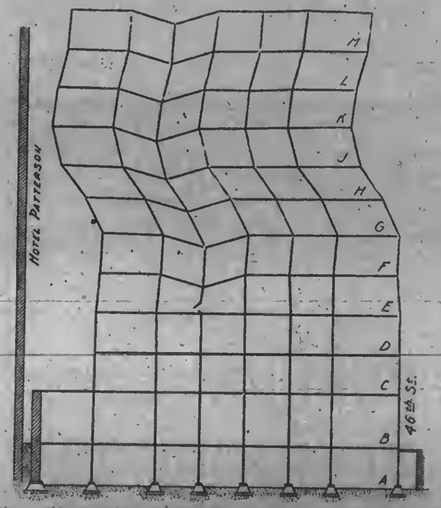

Fig 1.—Side Elevation of the Steel Frame, showing in slightly exaggerated form the failure of the column on the fourth floor, resulting in the collapse of the structure above it, which crashed through the lower portion of the building. The break occurring just back of the centre of the floor, the structure had a natural tendency to fall toward its centre, the greater amount of metal in the front, however, pushing the rear portion backward.

"Practically the building was pin connected. The bolts fastening the girders and beams against the column lugs were of smaller diameter than the holes, so that the columns received little or no lateral support. The column lengths were bolted together at the top and bottom, and acted as continuous columns. All loads were eccentrically supported on the side brackets. In consequence, the columns were too long to carry the superimposed weight and buckled. One column situated at or near the 'center of fall' broke. The upper part of this column being deprived of its support fell, and pulled with it the floor members bolted to it. Each of these floor members pulled over the adjacent columns to which the other ends were attached, and these columns having no lateral support broke at the lower flange, as the pull had a lever arm of about 10 feet, or the length of the column. This action and reaction of the stresses affected only the structure above the level of the original fracture. In fall, the mass off material from above crashed down and broke that part of the structure below the level of the original fracture.

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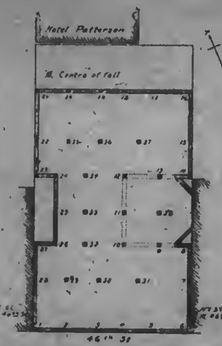

Fig. 2.—Floor Plan, showing the location of the cast iron columns according to their proper numbers, and indicating the "centre of fall" slightly to the rear and left of the centre of the building.

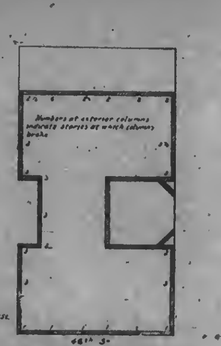

Fig. 3.—Floor Plan, showing the location of the cast iron columns in the outer walls, and indicating the stories at which these columns broke. The inside columns were practically all broken off at their bases.

did not crush them as it did the interior ones. The uniformity in hight at which the exterior columns broke strongly indicates that the primary fracture occurred at or about the level of the fouth floor.

"As proof that the top fell into and toward the 'center of fall' before the lower part of the structure collapsed, columns G 11 and K 11 were taken out of the debris near the 'center of fall' and from beneath other members, which originalily were connected at points lower down in the building. Near the same spot column D 36 was found standing in a nearly upright position. Of these columns, the first was broken at the centre and the other two at the flanges. Furthermore, as more of the structure was south of the 'centre of fall' than north of it, the northern, or rear, portion was forced outward against the Hotel Paterson."

NOTES.

The British Consul General at Berlin reports that the efforts to form a combination of the cement manufacturers throughout Germany for the purpose of improving the conditions of the cement manufacturing industry, have thus far not succeeded. Manufacturers in certain districts have got together, and they are now striving to bring in the South German and other North German groups.

In the course of the recent excavations at Pompeii there has been discovered and placed in the Museo Borbonico at Naples a bronze wire rope an inch in circumference and some 15 ft. long. It consists of three strands laid spirally together, each strand being made up of fifteen wires twisted together, and its construction does not, therefore, differ greatly from that of wire ropes made to-day. Pompeii was destroyed in A.D. 79; but how long wire ropes had then been known it is impossible to tell, though, judging by the knowledge shown in the construction, it may be safely concluded that they had been known for a considerable time. The uses to which these ropes were put are not definitely known ; but further excavations may possibly shed some light on the subject.

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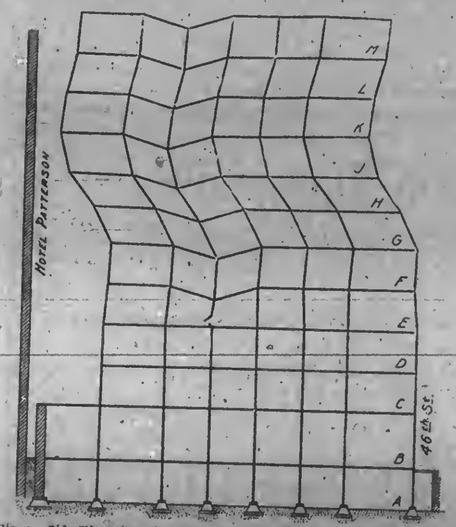

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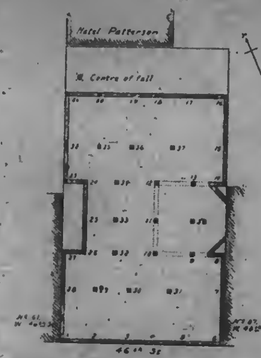

Fig. 2.—Floor Plan, showing the location of the cast iron columns according to their proper numbers, and indicating the "centre of fall" slightly to the rear and left of the centre of the building.

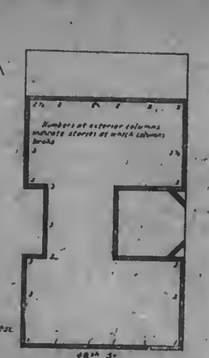

Fig. 3.—Floor Plan, showing the location of the cast iron columns in the outer walls, and indicating the stories at which these columns broke. The inside columns were practically all broken off at their bases.

did not crush them as it did the interior ones. The unifotmity in hight at which the exterior columns broke strongly indicates that the primary fracture occurred at or about the level of the fouth floor.

"As proof that the top fell into and toward the 'center of fall' before the lower part of the structure collapsed, columns G II and K II were taken out of the debris near the 'center of fall' and from beneath other members, which originalily were connected at points lower down in the building. Near the same spot column D 36 was found standing in a nearly upright position. Of these columns, the first was broken at the centre and the other two at the flanges. Furthermore, as more of the structure was south of the 'centre of fall' than north of it, the northern, or rear, portion was forced outward against the Hotel Paterson."

NOTES.

The British Consul General at Berlin reports that the efforts to form a combination of the cement manufacturers throughout Germany for the purpose of improving the conditions of the cement manufacturing industry, have thus far not succeeded. Manufacturers in certain districts have got together, and they are now striving to bring in the South German and other North German groups.

In the course of the recent excavations at Pompeii there has been discovered and placed in the Museo Borbonico at Naples a bronze wire rope an inch in circumference and some 15 ft. long. It consists of three strands laid spirally together, each strand being made up of fifteen wires twisted together, and its construction does not, therefore, differ greatly from that of wire ropes made to-day. Pompeii was destroyed in A.D. 79; but how long wire ropes had then been known it is impossible to tell, though, judging by the knowledge shown in the construction, it may be safely concluded that they had been known for a considerable time. The uses to which these ropes were put are not definitely known; but further excavations may possibly shed some light on the subject.

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NOTES.

The report of the building inspector of Vancouver shows that during the eight months since October 1st, 1903, there have been erected in that city 568 dwellings and over 100 buildings for business purposes.

As mentioned in a previous number it had been decided to remove the Eiffel Tower in Paris, but this decision has now been changed, and the Tower is to remain and to be adapted for use as a wireless telegraph station. The civil engineers of France presented a request that the Tower be not taken down, and the Minister of War conceived the idea of using it as a Military Station for receiving and sending wireless telegraph dispatches. The inventor, Mr. Eiffel, being anxious that the structure should remain, offered to pay all the expenses incurred in adapting it to its new purpose.

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For circular work allow double measurement.

For domes and groins allow three measurements.

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Coves, angles, beads, metal angles, jambs and enriched members measured per foot run.

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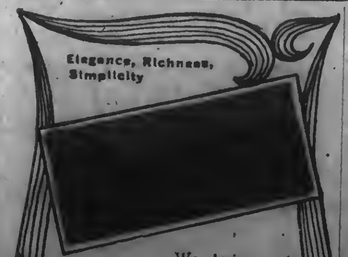

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Two coat on lath, hard white finish, 30c.
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Three coat, stucco finish, 45c.
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" " three coat, lime finish, 43c.
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The Canadian Architect and Builder

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ILLUSTRATIONS ON SHEETS.

Montreal City and District Savings Bank, Branch Office, St. Catharine Street, Montreal.—A. H. Lapierre, Architect.
Examples of Colonial Domestic Architecture and Elms at Fredericton, N. B.
Methodist Church, Port Arthur, Ont.—Langley & Langley, Architects.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Branch of Bank of Toronto, King Street West, Toronto.—Chadwick & Beckett, Architects.

ILLUSTRATIONS IN TEXT.

Plans Accompanying Article II on Wren's Churches.

CONTENTS

Editorial	129-130
Wren's Churches	131
By-Products in the Portland Cement Industry	132
Remarks on Ornament	133
Montreal Letter	134
Port Arthur and Fort William	135
Canadian Master Painters' and Decorators' Association	135
Northwest Notes	136
Montreal City and District Savings Bank	137
Particulars of the Scholarship Established by the Province of Quebec Association of Architects	137
A New Method of Excavating	137
Notes on the Supervision of Buildings	138-139-140
Strength of Wooden Pillars	141
List of British Firms Wanting Canadian Agents	143
Beauforts Scale of Wind	143
By the Way	144
Building Strike in Toronto	144
Legal	144
Contractors' Rules	ix.
Notes	ix-x-xii.

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Timber Specifications

Great changes have taken place during the last decade in quality and varieties of timber for construction purposes. White pine, which was the standard material twenty years ago, is year by year becoming scarcer and higher in price. This has caused the introduction and compelled the use of other kinds of timber, such as British Columbia fir and cedar, hemlock, southern pine, etc. For many purposes these substitutes are quite as good as the high grade white pine so largely used in the past. The Engineering Record states that architects and engineers have neglected to keep themselves fully informed regarding the changed conditions, and are still using forms of specifiations employed when white pine was the universal material. If this be the fact, our contemporary is quite right in its contention that timber specifications should be revised and adapted to the conditions now existing.

Toronto Building By-Law.

The Toronto City Council have adopted the new building by-law drafted by the City Architect, Mr. McCallum. Objection was taken by the local architects to a number of provisions in the by-law, and the Council appointed a committee on which the architects were represented to consider it in detail. The City Architect was unfortunately taken ill before the committee had got far advanced with its work, and the Council not deeming it wise to delay action, adopted the by-law. It is understood, however, that the Council have requested the architects to formulate their objections and have promised to give due consideration to any suggested amendments to the law. Action in this direction will be taken by the architects as soon as the rush consequent upon an unusually busy building season shall have subsided. While the by-law appears to require amendment in some particulars, it places the regulation of buildings on a basis altogether more satisfactory than formerly, and praise is due both the City Architect and the Council for prompt action.

Vaults.

The recent great fires in Toronto, Baltimore and elsewhere have called attention to methods of vault construction in buildings, and the extent to which vaults may be depended on to fulfil their purpose of protecting valuable documents deposited in them. Investigation of this question following the Baltimore fire showed the contents of twenty two bank and trust company vaults to be uninjured. The walls of these vaults were built up solidly of hard brick laid in cement 16 inches thick without iron supports, and were supported on brick foundations extending to the foundations of the buildings. Mercantile vaults, which owing to their greater number, are quite as important

as those already mentioned, were in many cases found to be faulty, and the users suffered heavy loss. The principal causes of failure were found to lie in cheaply constructed doors, lack of proper connection between doors and masonry, and vault doors and walls having been so tied to the walls of the building that when the latter fell the vaults went with them. This is a subject of such importance that it should receive the most careful attention at the hands of architects and building owners.

City Schools. Fortunately the price of land in Canadian cities has not yet reached the point where serious restriction is placed on the size of school sites and playgrounds. In New York no space is provided for playgrounds outside the area of the school buildings. Whatever provision is made for recreation is as a rule contained in the basement of the building. An exception to this rule has been made in one or two instances where a room for play has been provided on the roof, by carrying up the exterior walls, stretching wire netting over the entire top and making the flat surface of the roof waterproof, or converting the entire top storey into a playroom opening on to the roof. In the former case, receptacles containing steam pipes are placed below the roof level for melting the snow which might lodge upon the roof. Under such conditions as these school children cannot be expected to attain their highest physical or mental development. We in Canada should assure the welfare of future generations of children by making ample provision now in our cities for school and public playgrounds.

Decrease of Trade Disputes in England. It is gratifying to learn from a recently published Government report that for some years past in England disputes between employers and employees have been steadily decreasing. The average number of such disputes during the five years 1893 to 1897, was 816, and for the five years 1898-1902, 632. The number last year was only 387, affecting about one per cent. of the industrial population, loss of time amounting to less than one-fourth of a day per head. The majority of disputes arose over the question of wages. About one fifth were due to demands for the recognition of the unions. A large number of the disputes of last year were settled by the parties interested and through the agency of the Boards of Conciliation and Arbitration. This is a hopeful sign of the times, indicating the use in the future of more reasonable methods of adjusting differences of this character and consequently more harmonious and satisfactory relationships between employers and employees, such as formerly existed. It is to be hoped that Canada will not be found to be behind the motherland in this important reform.

Canadian Building We regret to note that the Canadian Building at the St. Louis Exhibition is as conspicuously common place and uninteresting as were those at previous exhibitions of the kind. It belongs to the jig saw class of architecture and as such is perhaps representative of country architecture in Canada twenty years ago, but certainly does not in any degree whatever represent either Canada or Canadian architecture of the present day. The occasion warranted the erection of a creditable building, the design for which the government might have secured by competition among Canadian architects. It is both humiliating and annoying that the development of our country and architecture should be so misrepresented before the world. Surely the Dominion Government, which boasts of having a surplus this year of more than $16,000,000 could afford to expend a few thousand dollars on the construction of a well designed building which would compare favorably with those of other countries, and of which Canadians would have no cause to feel ashamed. If as a people we are too poor to do this, let us not advertise our poverty by putting up any more poverty-stricken buildings at International Exhibitions.

New Union Depot for Toronto With commendable promptness the railway authorities and representatives of the City of Toronto presented to the Railway Commission at Ottawa their arguments as to the terms which should govern the transfer to the railways of a site for a new union station on the south side of Front street. With equal promptness the Railway Commission fixed the terms which have been declared to be satisfactory to all parties concerned. There remains therefore no obstacle in the way of the immediate carrying out of the enterprise, the early completion of which will materially advantage both the railway and the city. The present terminal facilities are not sufficiently modern or convenient in arrangement and are entirely inadequate even for the rapidly growing passenger and freight traffic of the G.T.R. and C.P.R. The desired entrance into the city of the Canadian Northern Railway brought the project for improved accommodation to the point where action upon it could no longer be deferred. The decision arrived at should ensure the construction of an imposing building in the heart of the burned district and the immediate removal of the unsightly debris now covering the site, which might otherwise have remained for months or years. It will no doubt also tend to encourage the early construction of a good class of buildings on the surrounding property and greatly improve the approach to the city whether by rail or water. The importance of securing the best possible plan for so important a structure is obvious. The best result would probably be attained by a limited competition among a number of leading Canadian architects. This would bring to bear upon the problem the best thought of a number of trained and experienced men, from whose combined efforts a thoroughly satisfactory solution might be expected. For the success of this plan two things are necessary (1) the appointment of competent arbitrators in whom the competitors would place confidence to draw up equitable conditions to govern the competition and judge the plans; and (2) a sufficient sum in premiums to compensate for the time and expense involved in the elaboration of so important a scheme, together with the assurance that the author of the design awarded first place would be given charge of the work. While the majority of Canadian architects are unusually busy at the present time, the season is now well advanced, and no doubt many would be found willing to enter a competition which would offer them opportunity to distinguish themselves, provided the conditions were fair and the prizes attractive.

WREN'S CHURCHES.

(SECOND ARTICLE)

In a previous article an example was given of one of Wren's plainest plans, which is nevertheless a pleasing and interesting church. It would be going too far to say that the plainest plans are the most impressive, but the greatness of the impression compared with the simplicity of the means is striking—and instructive.

There are only three further developments in the members of Wren's church plans, apart, that is to say, from the shape of the plan which was varied in several ways. He added a sacrarium or sanctuary, a single aisle, and a double aisle. It might be added, as additional variations, that the aisles were sometimes galleried and sometimes not.

Of the sacrarium plan, All Hallows, Lombard street, is a good example (Fig. 1). Wren went no further

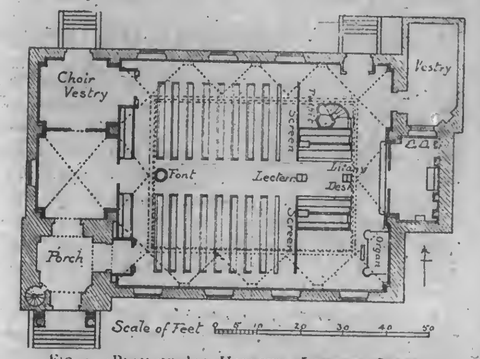

FIG. 1.—PLAN OF ALL HALLOWS, LOMBARD STREET.

than this in the development of the East end. There was no thought, in his day, of placing the choir at the east; the communion table alone had to be provided for, and this recess, which is 20 feet wide (or 18 feet between the pilasters at the angles), is handsome without being unmanageably large. The great difficulty connected with its insertion lies in the junction of ceilings; for the sanctuary should not be a hole in the east wall, but should rise to the fullheight of the church and its ceiling should run with the main ceiling.

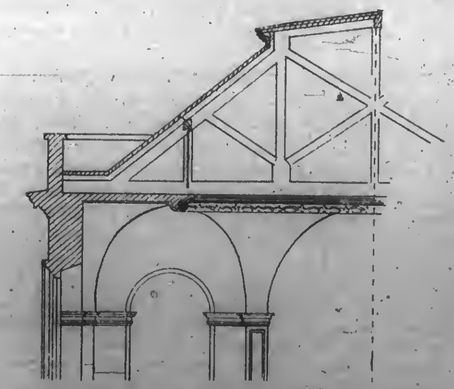

FIG. 2.—SECTION OF CEILING OF ALL HALLOWS, LOMBARD STREET.

Wren's way of managing this was to have a main ceiling with a large cove and to penetrate the cove for the sanctuary. The ceiling, which is shown by dotted lines on the plan, has a cove 9′ 6″ deep and 8′ 0″ in projection, terminating in a large roll and cornice (Fig. 2) which runs round and makes a central panel 32′ 0″ x 44′ 0″—a field for decoration in secular work of this period, but never so treated in these churches. The windows in the north and south walls of the church have round heads, springing like the cove from the top line of the cornice; so the cove is penetrated for the windows, which are so spaced as to break up the cove into continuous penetrations, and these are continued over the blank spaces on the east and west ends, which have round-headed recesses to supply the motive. The central penetration of the east end forms the inlet of the sacrarium ceiling. This penetration is about 5 feet wider than the others. The 5 feet of increase is accomplished by an adjustment of the angle of penetration, which must produce a flatter curve, but the eye cannot discover its difference from those on each side of it.

The extent of opening that can be spanned in this way is limited by the size within which a ceiling cove must be kept; so that the expedient does not solve the difficulty of reducing the width of a single span body for a choir (which would be wide as compared with a sanctuary) while keeping continuity of roof. It is, however, a question whether this difficulty is not better accepted than solved, for the choir is better of the same width as the body than narrowed to make a sort of cave in the east wall of the body.

It is hard to say, in view of the 156 feet width of the single span of the new Roman Catholic Cathedral of Westminster, that the width of the body of a church can ever be too wide for the choir, if there is length in proportion; but, though the choir needed for a church 350 feet long will be no more than suitably housed in a choir 156 feet wide, should the church be 156 feet wide and compelled to be about the same in length, it is time, on account of both practical and proportional suitability, to take to columns.

Wren, as a churchbuilder, is usually thought of in connection with his largest churches, with their double colonnade and galleries; but he used columns in many different ways, to reduce his churches to a convenient form that could be economically roofed. There is not much evidence of any gradual development of his types one from another, but the dates of completion of the churches show that he favoured certain types more at one time than at another; and in the last ten years of his practice there are four little churches of one kind which, though their idea appeared earlier, may be taken, by their frequent appearance at that time, to represent ripe judgment. This type is the one-aisled plan. The difference between one aisle and two aisles is greater than the difference of an aisle. In a one-aisled church the appearance may be said to be that of a body with an aisle appended. When there are two aisles the composition is made by the aisles; it is an aisled church; the distinction between body and aisles becomes a mere matter of nomenclature for convenience of reference to locality; there is no separation in the mind. What makes this difference between one aisle and two aisles is of course the solid wall on one side of the one-aisled church. This limitation is associated in the mind with the other side also, so that the body is felt to be the church and the aisle an appendage.

When first seen in plan, such a church may appear to have an uncomfortable lack of symmetry, and perhaps it is not for nothing that this type is confined to

churches of small size. On a large scale, the more dignified symmetrical plan with double aisles is necessary, no doubt, if there are aisles at all; but for a church of this size and even larger—St. Lawrence Jewry is nearly 50 feet wide and over 80 feet long—a one-aisled plan is much to be preferred to a duo decimo copy of a grand church with double aisles. The variety given in a one-aisled church by the two sides, with responding composition, but different appearance, is a source of more actual interest than is given by double aisles.

If the seating space of two aisles is desired a gallery may be inserted. The philosophy of the gallery, apart from considerations of expense, is that when the congregation is small it need not be used; and thus scattering, which has a bad moral effect, may (in these days of free seats) be prevented. When the congregation increases, or if there is a special occasion, the gallery comes in as additional seating space. In this way St. Margaret Pattens—which appeared to be comfortably populated by a week-day congregation which counted as 62—is said to be seated for 500—has held 600 sitting persons, counted by the verger; and is thought to be capable of giving standing room to 100

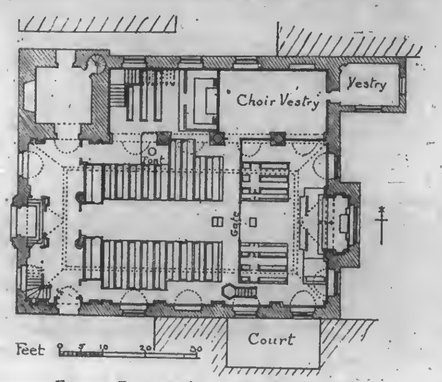

FIG. 3.—PLAN OF ST. MARGARET PATTENS.

more. This elasticity is due in great measure to the handsome allowance of space for passages, which is common to all the city churches and contributes so much to their dignity. At first this feature seems anything but encouraging, but as a means to effect it is on the whole cheap. It is the additional space, over what is necessary, that makes the difference; and, if the additional space only is taken into account, its cost will not amount to much to set against the cost of columns and arcading. Moreover, whereas dignity is to be got by superfluous space without arcading, it is not to be got by arcading without superfluous space. The lesson of what can be got by superfluous space only is a lesson of the necessity of superfluous space under all circumstances. Superfluous space is an aesthetic necessity, but it has this advantage over other aesthetic necessities that it adds at a pinch to the seating accommodation.

In the case of St. Margaret Pattens, the gallery front is an additional interest and the portion which is enclosed for a choir vestry also encloses satisfactorily the choir within solid walls.

There is a low screen or fence, of panelled and carved oak, enclosing the front of the choir, with an open-work wrought iron gate across the passage.

The ceiling is similar to that of All Hallows, Lombard street, in plan, but smaller in scale. There is a cove, penetrated for a portion of its height for a circular clearstory window over each intercolumn, and penetrated its whole height for the sanctuary opening; which latter is then finished by an arch and a barrel vault.

The organ is at the west, in a gallery over the vestibule. In so small a church this works perfectly and is in fact an improvement, for the organist at work is no gain to the east end. In a large church the evidence of experience is, on the whole, against separating in this manner the organ and the choir; but the evidence is not so strong as might be expected. It is only in the seats towards the east of the church that there is any doubt about the blending of sound. At the western end of the church it is perfect.

W. A. LANGTON.

BY-PRODUCTS IN THE PORTLAND CEMENT INDUSTRY.*

In the course of the investigations conducted by Dr. W. Hillebrand at the request of the Committee on Uniform Methods of Analysis of Materials for the Portland Cement industry, he found that when a raw mixture which contained 0.69% of potash and 0.22% soda was ignited in a platinum crucible for one hour over an ordinary blast lamp, the resulting cement contained but 0.07% of potash and 0.09% of soda. The alkalies had been nearly completely volatilized and the potash more completely so than the soda.

It at once became of interest to determine whether the same thing took place in the industrial production of Portland cement clinker. It was found that from a raw mixture made from marl and clay which contained the percentages of alkalies mentioned above and which should in consequence contain 1.26% of potash when burned (if none of it was volatilized) since the loss on burning was 37.50%, 0.65% potash was carried off in the flue gases at the temperature of the rotary kiln. An investigation of the flue dust proved that the alkalies were carried further than the point where this material is deposited and it is apparent that by conducting the gases through a horizontal chamber where the temperature could be reduced to a point low enough to permit of the deposit of the potash, this could be collected, perhaps, aided by a spray of water or steam.

The importance of this discovery is apparent if a calculation is made of the actual weight of potash which is produced and lost this way in a cement plant turning out 4,000 bbls. a day, or 700 tons of material. Six-tenths of one per cent. of this would mean 4.2 tons of potash which now goes to waste, but which could be readily collected and have a value of a least $12 per ton (that of kainite with 12% potash) and with a probable value of $45 per ton that of commercial emeriate used for fertilizing purposes. In the latter form over 4.2 tons of potash would be the equivalent of 6.6 tons of emeriate, so that allowing the excessive sum of $50 per day for the expense of the process and interest charges, the profit from a single plant of the size mentioned would be between $100 and $200 per day. It would seem that the development of the process would be of commercial interest. In conclusion it may be said that Dr. Hillebrand has an application pending for a patent covering it.

*Paper read at the 7th Annual Meeting American Society for Testing Materials, By CLIFFORD RICHARDSON, Long Island City, N.Y.

SOME REMARKS ON ORNAMENT.

By FRED. T. HODGSON.

There has perhaps been no other art which has made such radical improvements within so short a period as that of ornamentation, and this has been accomplished in the face of great difficulties, and by very peculiar methods.

The artistic and studious decorative architect is forced to combat that constant and ever-present belief entertained by women, that in the decoration of their homes their own individual taste should prevail, notwithstanding the fact that their ideas of color and harmony are necessarily crude and undeveloped. So also there are numerous charlatans in all the building trades, who persuade their customers that a decorative architect is unnecessary and a mere fanatical encumbrance. Still, ornamentation has steadily improved, until it can now be said that there is a decided change for the better in the various methods of treatment, which change, however, has not to any appreciable extent affected the ideas of the public generally.

Many sensible men who have some instinctive idea of the "eternal fitness" of things, not only employ an architect to design and superintend the building of their homes; but they engage them to design the furniture and general decoration. This is as it should be, for an architect—if worthy of the name—is better fitted to design or choose fitting furniture and proper colors for decoration, after designing the main structure, than any other person or number of persons possibly can be.

It is within the memory of many now living that after the teaching of the late unfortunate Oscar Wilde, a change seemed to take place from the old established forms of ornament to new and improved methods of treatment; and a study of the ideas of Mr. Wilde will disclose the fact that there was "a method in his madness", since, by his many peculiarities, the minds of people were attracted to that which otherwise would have passed unnoticed.

There is, however, a sad lack of originality in ornament, since its choice is of far more importacce than designers as a rule are able to discover. For example, a stencil or wall-paper, is to be designed, The natural impulse of the average designer is to rush to "Owen Jones's Grammer of Ornament" for an instance of the school decided upon; but, in accordance with all reason, this is just that which should be avoided, since the text books will soon be exhausted, and finally, when the designer has run the gamut of ornament by copy, he will discover how, for lack of thoughtful study, his work is without originality. If our designer be a man like Mr. Louis F. Day, he will invent an ornament of no particular period or school, but a combination of the motives of as many as afford material for a design complete in itself, uniform, and of one part—not, as is too often the case, consisting of details and actual parts of a number of schools assembled or thrown together and called an original design.

It is the study of the motives and principles of the various schools of ornament, and not their mere imitation which is required to produce original designs.

It may not seem amiss or pretentious to suggest a few rules, giving illustrations showing their applicability, for observance in ornamentation.

First—Ornament is not necessarily a decoration applied to an object independent of its construction, but should be a part or whole of its construction. This rule is aimed at the prevalent ideas which at this time are nearly obsolete. Formerly it seemed to be the intent of the cabinet maker, for instance, to hide obvious necessities and in order so to do, ill adapted relief carvings were glued on to the surface, and useless knobs and handles were attached, all natural openings being hidden by mouldings and fillets.

It is now the rule to avoid attaching to the object unnecessarily ornament, and to embody in the article itself the ornamentation.

Second—The ornamentation should not in any way interfere with the utility or object of the article. For instance, it is almost impossible to find two paper knives exactly alike, and yet it is equally impossible to find more than one in a dozen which has not been over ornamented. The ordinary paper knife is very likely to have a handle covered with spurs, or rough portions, making it painful to grasp, as in many cases turned, or carved, to such an unreasonable extent as that it is too frail for use, the original object of the knife being sacrificed for ornament. As example of graceful ornament, and well worth consideration as an illustration of its utility, are some of the iron registers in churches or other public buildings, however, admirably adapted for the purpose; perfectly flat and even on the surface, the open space so arranged as to allow the air to rise evenly, and the ornament so disposed as to sustain great weight.

Third—The material should be treated naturally.

That is, if wood, it should be treated as wood, and not twisted and painted as only iron should be, and, if metal, it should not be moulded to represent a log of wood, or wood carving, as it often is.

Fourth—The ornament chosen should be suitable and appropriate.

A bunch of wild flowers painted on a miniature shovel is not appropriate; decorated clothes pins to fasten napkins are hardly beautiful; an old shoe, dried and gilded, used as a receptacle for flowers is not suitable, and in all these cases it is thrusting into view objects which are not pleasantly associated with the drawing room or table.

Fifth—The object should never be made to represent that which it is not.

A door or wainscoting may appear to be walnut, mahogany or oak, but a chip at a corner or a joint, or even a casual inspection, discloses the truth that that which was originally a cheap wood has been covered with a coat of staining and the skulking grainer has traced the markings of a more pretentious wood thereon.

Few arts have been more radically modified by the introduction of machinery than the art of building. The stone mason holds his own againt the innovator more stubbornly than the carpenter; but almost entire dwellings, above the foundations, are now manufactured in factories and then delivered on the ground ready to be placed in position. The men who set them up are still called carpenters, the wrong word of the old title "carpenter and joiner" having been retained. They would be better classified were they called joiner, or they might be called finishers in carpentry; but they are certainly not in any true sense carpenters. The real carpenter has become a machine and though this machine may be able to prepare only the manufactured material for frame buildings, it is equally true that all the interior fittings, whatever the material, of brick stone, or

marble buildings, are now in a great measure factory made, and delivered ready to be placed upon the walls or whereever they may be needed.

Machine and stuff, so far as architecture is concerned, cannot be said to be a gain in the direction of art, though, from an economic point of view it has its advantages. It has enabled us to build well with a greatly less expenditure of money than building operations, would cost were we dependent upon hand labor alone, and it is also the cause of a great deal of building that would never take place bnt for its co operation. It is quite certain that much of the building to be witnessed in our great cities is due to the existence of wood manufacturing firms, and were it not for their fransactions building operations would have to be greatly curtailed. These advantages, however, are gained at the expense of true art.

MONTREAL LETTER.

No. V.

Some fairly extensive additions are now being made to the Law Courts and this leads the Gargoyle to make certain reflections with regard to this building as a whole. The characters of individuals are expressed in their dress and conversation and may be readily discerned in the things they make, or do or get made and done for them or even in the objects they select and purchase to surround them in their daily life. Just so the character of the citizens must be discernible in their public buildings. Architects or builders of whatever degree of skill or accomplishment are simply taking the ideas of their clients in verbal instructions and rendering them back to them in stone, lime, wood, or whatever material may be ordained by those who order. It will be just therefore to examine the courts which a city has built in which to have justice administered and to judge of the city itself thereby. Let Montreal then in this matter pass under the architect's cross examination.

This building is of no mean dimensions showing that the citizens had a sense of the importance to them of Justice, who, in a city which invites traders and workers from all ends of the earth to the continual friction incident to busy commerce and great material enterprises, must not be huddled in a corner to do as well as straightened circumstances will allow her, but must have ample space to exercise her rule. Rightly also the Law Courts stand quite in the busy haunts of men, and yet free from actual contact; for the hands of Justice must be clear of the strife she is to judge. Though in the lower part of the city the Courts with their neighbour the City Hall crown a small ridge sufficient to make them conspicuous in the city itself and also from all more distant points of vantage.

Approaching from Craig Street, it is with pleasure that one comes into the spaciousness of the Champ de Mars and raises the eye towards the two large buildings which dominate the open space from its farther side. The Parade Ground itself has a painfully arid look, but the young trees which demurely dot its borders give promise of a pleasanter future. The manner in which this ground is terraced high above Craig street affords a noble base for the two chief buildings of the city.

All this is very satisfactory and makes one eager to make acquaintance with the features of this home of Justice so wisely and advantageously placed. The best view is obtainable from Craig street, and the expectant glance meets with a rebuff that sends it staggering in the direction of the City Hall to catch if possible some gleam of hope, but only to recoil once more to find perhaps a little rest and comfort in the simple honest faces of those buildings which from St. Gabriel street have reviewed the manœuvring troops for a hundred years.

These buildings actually have their backs turned towards this fine space! Why, yes, they must have backs somewhere you know; and Notre Dame street and a superior class of business have their claims on the other side. But why such aggressive backs anywhere? What has Craig Street done? Is it Justice that should wear good cloth in front and shoddy on her back and turn it uncomoprmisingly upon the poor? If through lack of gold her dress cannot all be of finest stuff at least why not of one good web throughout? Last week we spoke of the Bank of Montreal, and taking a cast back along Craig street one may there see a stately, stalwart, honest back enough, not overlaid with elaborate drapings but having only the simple necessities of the case wrought into an organic expression it rises straight and simple from footpath to cornice a 'living' wall of stone.

This matter of the back of a building is one in which the Mooteregians have a particularly rooted misconception. There is little doubt that this arises from the fact that in Montreal excellent stone is obtainable at no very great cost but brick is more readily obtainable at a less cost. Hence it has become a habit, and a very irritating one it is, to make buildings with a stone front and brick sides and back. I suppose people who like houses of this sort must be the class which wears one character on Sunday and another the rest of the week. The only presentable one is for Sunday wear and meets with much acceptance from those like minded. The stone front to the brick villa is of a similar value. It is not a virtue but it is a homage paid to a virtue too expensive or too troublesome to be actually maintained. There are certainly better ways of meeting the case. Some models of a very sensible and legitimate method exist among the works of Mr. Norman Shaw, as for example the buildings of Scotland Yard in London and the offices of the White Star Line in Liverpool. Both these grand buildings stand on bases of hewn stone or granite and the upper stories are constructed of brick with the occasional introduction of bands or members of stone in such a manner as to make of this interchange of materials a decorative motif of distinct architectural value. The nobler material thus keeps helping out its humbler fellow all along, and together they form a unity and not a motley assemblage of elevations.

But we have wandered from the Law Courts. Let us return and try to feel thankful that the back was not built of brick. Let us suppose that the apparent one sidedness of Justice is not occasioned so much by the poverty of Craig street as by the well known distaste of Lower Canada for an aggressive militarism here only to plainly represented by a drilling ground and a drill hall. Likely enough Justice is only very properly refusing to countenance dragooning operations.

The original law court building has been one of quite considerable quiet dignity and force of character, its front in quiet retirement behind a little grove of trees has still a pleasant expression of dignified calm. This structure has consisted essentially of a basement or ground storey of chamfer jointed masonry surmounted by two stories unified in point of design by large Ionic columns extending through both. The main entablature has then formed a crowning member to the whole building, which, though broad and simple, is not without an agreeable variety of features. Unfortunately this has not been considered sufficient for the needs of an increasing city. On the top has therefore been added another storey in the form of a classical "attic," built indeed of stone but crowned with a cornice and balustrade, both apparently of sheet iron. In the centre of all rises a kind of saloon deck in a number of stages surmounted by a dome. All this portion is executed in . . . . ; well, some Toronto man might read this, so I don't like to mention what the top of our Law Courts is made of, but the owners are doing their best for it and have just given it a nice new coat of paint which makes it look as like stone as can be expected—that is to say, very unlike it indeed.

Now Montreal who is to blame for this? Will you put the blame on your architect? The most inferior architect I ever knew would have preferred to use stone, and the more inferior he might be the more reasons would he have had for using stone—the superior man could only have one. Moreover the hand that is displayed in this additional work shows a greater sense of refinement than that which controlled the original building, which though honest simple, and robust, inclines to harshness. Surely the citizens that have had the seat of Justice in their midst thus stuck with cheap trappings were wanting in respect to Justice and to themselves.

Let us next have a look at the works at present in progress. It would be expecting too much that these should entirely redeem the situation, tacked on as they are in an odd corner facing a narrow street on the opposite side of which are some old buildings between St. James street and Notre Dame street. For the sake of the Law Courts it would be well if this block of buildings could be removed. The new buildings though standing well in view along the eastern and finer part of St. James street, do not occupy any definite relation to that thoroughfare. We have sufficient faith in the architectural soundness of the original building to wish that an effort had been made to bear it out in the new. Yet in spite of all these disadvantages it must be admitted that the treatment of the new building has a boldness and vigour of its own. The work being still incomplete, it is too early to criticise it as a whole, but the strong handling of the ground storey with bellied courses of approximately semi-circular section and the strong simplicity of the two upper stories make one anticipate some excellent work.

It is surely to be regretted that looking at this building from Craig street it appears to attach the block of buildings which form the Law Courts to the general mass of the city on this side thus destroying the appearance of isolation which is so valuable to an important building. In addition to this, this side has again been treated in a most summary way as a thing of no account. If the tenants on Craig street are at all sensitive they must feel more than ever like pariahs from whom respectable citizens turn their faces. The moldings of the front are taken round for a few feet and then returned on themselves and everything is bare to baldness. Again if it be asked—Is not the architect to blame? One must reply: Is an architect likely to want to do things so, or is it not more likely that they should be forced upon him? This sort of thing is the evidence of want of self respect on the part of the citizens.

The moral of all this is that an architect has got to educate his clients so that they may give him proper instructions, and if he be an architect of civic buildings he has to educate the officials with whom he deals so that they may train the general public to give him proper instructions. To prepare themselves for such tasks as these architects must get up very early in the morning. So the Gargoyle turned in for the night.

GARGOYLE II.

PORT ARTHUR AND FORT WILLIAM.

(Notes by a Travelling Correspondent.)

The past year has been marked by the rapid progress made by the twin cities of Port Arthur and Fort William, both of which have developed into great shipping ports for the vast crops of wheat produced in our great west. Every citizen of both cities has a right to feel justly proud of the steady advancement made and which is still continuing. Fort William alone has expended no less a sum than $248,000 in business blocks and residences, an increase over that of the preceding year of $100,000, while the population and assessment have increased over 25 per cent. The Canadian Pacific Railway Company has completed at this point one of the best coal handling plants on the continent of America, and has also erected and is now operating elevators "D" and "E," and a modern machine shop capable of overhauling four large locomotives per month, besides other works of slightly less importance. The Imperial Oil Company's works here for supplying the Canadian market west of this point still continue to grow, and during the year they have handled 2,000,000 gallons of refined oil, besides 5,000 barrels of lubricating oils and 4,000 cases of other products. The John McKellar Memorial Hospital which was opened June, 1903, has supplied a long felt need, while so great have been the demands made upon it that it is almost safe-evident that an addition will soon be necessary.

In Port Arthur over two hundred and fifty dwelling houses have been erected at a cost of $250,000, and some $175,000 has been spent in the erection of stores, offices, warehouses, etc. The Canadian Northern Elevator Company has expended over one million dollars for increased elevator capacity and docks and the King Elevator Company some $250,000 in connection with its storage annex.

In lumber circles the Northern Land and Lumber Company, a party of Wisconsin capitalists, have erected a very fine planing mill and are handling large stocks of white and yellow pine.

At present building operations are not nearly so brisk in either cities as they have been during the past two years as the construction of the projected large elevators has not yet begun and also a large amount of money has become tied up in speculative real estate. Mr. M. B. Aylesworth, one of the leading architects of Port Arthur, is now busily engaged on several important buildings in both cities, including the city hall of Fort William, a stone and brick office building in Port Arthur for Councillor T. N. Andrews, a large residence for Mr. James Meek, the Provincial Court Clerk, a store and dwelling for D. M. Davidson, residences for H. G. Greenland, of the Bazaar, and John Ritchie school inspector for the district, and a new stone Methodist church, while he is now busily engaged drawing out plans for a giant skating, curling and hockey rink. The city hall at Fort William has been in progress for nearly one year, but it is not expected it will be ready for occupation before June of 1905. However, work has been pushed rapidly along on the Auditorium wing, which will be ready for the opening entertainments in the course of a month or so. The proceeds of these opening entertainments are to be devoted to the John McKellar Hospital fund. The estimated cost at completion of the City Hall will be $70,000.

Besides the work undertaken by Mr. Aylesworth in Fort William there are three good sized business blocks, a four roomed school house and a large number of good residences in course of construction. The Canadian Pacific Railway Company, in place of the burnt elevator are erecting a large working house for the series of elevators. They have recently completed a large power house for supplying electric light to their yards and power for pumping, etc. A large brickyard has also been added to the industries of the town, this making the fourth; all are operating to their fullest capacity.

At Port Arthur there is a possibility of a smelter being erected to handle the rich iron ore deposits of Loon Lake, which lie twenty miles to the north of the city. A charter has already been applied for by the company to enable them to build a short line railway to Thunder Bay.

Architects of Ontario and the States will be much interested to learn that the long disused stone quarries of Vert Island in Nepigon Bay are about to be worked again. They have been idle for the past twenty years having been in the first place opened up to supply the stone for the erection of the famous wholesale house of Marshall Field & Co. on 5th ave., Chicago. The Sawyers Bay green stone quarries have lately been operated to supply the recent demands of the twin cities.

CANADIAN MASTER PAINTERS' AND DECORATORS' ASSOCIATION.

The first annual convention of this new organization was held at the Windsor Hotel, Montreal, during the last week in July, the president, Mr. L. Z. Mathieu, presiding.

Papers were read and discussed as follows: "Advantages of Membership in the Master Painters' Association," by Stewart N. Hughes, Toronto; "Our City Fathers, Their Relation to, or With Labor Organizations," by A. M. McKenzie, Hamilton; "Varnish, its Uses, Methods of Manufacture and Adulteration," by A. T. Blackwell, Toronto; "Necessity for Trade or Technical Schools," by W. E. Wall, Cambridge, Mass.; "The Purifying of our Establishments from the Evils of Unionism," by J. N. Arcand, Montreal; "Competition in the Painting Business," by Jas. Phinnemore, Toronto; "The Apprenticeship Question," by W. T. Castle, Montreal; and "Reminiscences and Comparisons in the Painting Business During the Last Half Century," by John Murphy, Montreal.

The officers elect for the ensuing year are: President, J. N. Arcand; Vice-president, A. M. McKenzie; secretary, Stewart N. Hughes; committee, Messrs. O'Hearn, Brooke, Johnston, Morley and Stamp. Messrs. L. Z. Mathieu, S. N. Hughes and G. S. Faircloth were appointed delegates to the international convention at Milwaukee.

The social features included visits to local manufactories and an evening reception in the hotel parlors.

Exhibits of painters and decorators materials were made by Messrs. Berry Bros., the Canada Paint Co., Ramsay & Co., Sherwin-Williams Co., Watson, Foster & Co., Colin McArthur & Co., and Stauntons, Limited.

The next convention will be held at Hamilton.

NORTHWEST NOTES

Branch Office of THE CANADIAN ARCHITECT AND BUILDER,
310 McIntyre Block, WINNIPEG, August 12, 1904.

Building operations have been somewbat hindered during the past month, the holding of the Dominion Exhibition in Winnipeg since last issue having naturally turned all thoughts in that direction, and for the last few weeks the usual amount of work has not been done. There are still a great number of building permits being granted, but chiefly for small houses, the demand for which is still very active. The Winnipeg Street Railway Company are on the eve of starting the erection of some additional sheds and works in the Southern suburb of the City, the result being that property in the vicinity has been materially advanced in price. Work is just about to begin on the new Opera House, a project which has been in contemplation for some time. Excavators, too; have just commenced work on the property of the T. Eaton Company of Toronto, preparatory to the erection of the large departmental store they are proposing to open in this city. The Bell Telephone Company are also contemplating the erection of a new factory alongside of their present one, which will about double their present warehouse space.

CEMENT BLOCKS FOR BUILDING.

An exceedingly interesting feature of the exhibits in the Dominion Exhibition, and one which came at a particularly opportune moment, was that of the various appliances for making cement blocks. In our last issue we pointed out the great difficulty which has been experienced in Winnipeg in obtaining materials for building. Brickmaking has been pushed forward with great energy, but with little apparent effect in satisfying the demand. The stone industries are unable to keep work under way and many buildings which would have otherwise been completed are now not likely to be finished before next season opens. To the interested observer, therefore, these exhibits must have been instructive. In the States it seems that cement is fast gaining in favour as material for building. The evolution of machinery in its application to the cement industry, places on the market a "block" which appears to be commending itself wherever the subject has been given due consideration. As a fire and weather resister cement stands well to the front, and as regards appearance and durability, it is quite capable of holding its own. The subject is one, therefore, to which architects and builders are giving a good deal of attention. Its cost is materially less than stone and its appearance almost equal. As compared with brick, the labour in laying cement blocks is less costly and can be executed by less experienced workmen, which gives it a set-off against the apparently larger original cost, many claiming that in result it works out less costly than a brick building.

Foremost of these exhibits was that of the North-west Pressed Stone Company, who were shewing a "block" for which they hold a special patent not only as regards the block itself, but also the machinery for its manufacture. A great feature of this block is that it has a double air space and it is impossible to pierce a wall built with these blocks without encountering an air space. The company also carries a complete outfit of machinery to work in conjunction with the block-making machine, so that an outfit can be installed to work with the minimum amount of labour and equal to 400 to 500 blocks per day.

Another power cement block making machine was that shewn by Messrs. Gutteridge & McConnell, of Hamiota, Man. This machine was capable of 90 strokes per minute and the actual time taken to produce a perfect block was three quarters of a minute. With this machine it is possible to produce 600 blocks per day. A special feature of this machine is a device by means of which a block can be made with a colored face of cement some two inches thick, with the remainder of the block in natural colour.

The National Cement Block Machine Co., of Toronto, were shewing a machine with a special non-corrosive metal plate, which certainly made a block scarcely discernible from a block of stone. This machine, however, was not adapted for power; by hand labour the output would be some 150 blocks per day.

The Cement Building Block Co., Ltd., of Winnipeg, had also on exhibition a sample of their work in the form of a wall with details, such as corners, doorways and windows. It was stated that the machine exhibited, worked by hand, produced some 120 blocks per day.

The Canada Petrified Brick & Stone Co., Ltd., had on show a sample of their products, erected to show the usual mode of construction, both for their special make of brick and also for their hollow cement block. Their chimney blocks attracted special notice as making an exceptionally neat finish. This company have a secret in the manufacture of their goods whereby the cement and sand are joined together, and get extremely hard by age.

These exhibits are of special interest at the present time when the building question is one of great importance and the hindrance to progress is mainly that of not getting sufficient material.

DECORATION AT THE EXHIBITION.

There was nothing large or particularly new in this feature of the Exhibition. To those who are aware of the immense strides made in the Eastern Provinces in this direction, it would appear that a good opportunity has been lost in this ommission. The ordinary class house in Winnipeg is usually disposed of in an unfurnished state as regards internal decoration and often remains so in the hands of the occupant for a great while so that there is ample room for stimulating these lines. The Metallic Roofing Co., of Toronto, the western agent for whom is Mr. T. Black, 130 Bannatyne ave., Winnipeg, made an excellent display. Their stand was a large and prominent one, and extended right across the centre of the building, the walls being arranged in sections, each shewing a different decorative treatment in artistic colors. This company also showed embossed metal shingles and sidings. Their designs of roofing tiles known as "Spanish Diamond" and "Gothic" attracted much attention and comment.

The Winnipeg Ceiling and Roofing Co., of Winnipeg, also exhibited a fine ceiling arrangement of Imperial design, mounted in a massive gilt frame, which shewed to advantage. This company, we understand, are the only actual producers of this line of goods in Winnipeg.

Mr. E. S. Holston, of 937 Logan ave., Winnipeg, had on show a selection of high grade front doors made in special patterns, and of fine quality and finish. This firm aim to keep on the market goods of the highest grade and to supply only wholesalers.

The Winnipeg Paint and Glass Co., Limited, had an attractive exhibit, prominent in which were three samples of cut and ornamental glass. They also exhibited an attractive array of glass doors, built and turned newels and internal fittings generally. An attraction at this stand was their exhibit of model cottages shown in the interests of Ramseys' paints, and which presented a very gay appearance.

The Winnipeg Mantel Company had on show a fine range of mantels, grates and tilings.

The Canada Plate & Window Glass Company, of Toronto, were exhibitors of fireplaces and fireplace fittings. They shewed an unique range of these goods, arranged with good effect and also had on show samples of their ornamental and plate glass.

STOVES AND FURNACE EXHIBITS.

The industry more largely represented than any other, and which commended almost universal interest, was that of the stoves and furnaces. Probably the largest and finest exhibit in this department was hat of the Gurney Foundry Company, who besides having an exceptionally fine position, had also laid it out in a most attractive manner, with a full line of their cooking and heating stoves, furnaces and radiators, decorated in pleasing colors.

The Record Foundry & Machine Co., of Montreal, Moncton, Toronto and Winnipeg, also showed a fine range of stoves and ranges, and although they have recently increased their capacity, are still finding it difficult to meet the demands of their trade. This company showed a specially constructed combined furnace adapted for either small houses or large buildings, and which commended itself as particularly adapted to this district.

The Lennox Manufacturing Company also showed a furnace, the main features of which were a steel dome, particularly sensitive as a heat holder, and an interchangeable fire pot; it was claimed that the consumption of fuel in these stoves was considerably minimized. The Western agents are Merrick Anderson & Co., Winnipeg.

The Christie Bros., Limited, 238 King street, Winnipeg, agents for the Canada Heating & Ventilating Co., Owen Sound, had on view a range of cooking stoves of unique construction. These stoves are so arranged that the heat encircles the oven twice, making it a perfect baker and cooker. They also showed the Empire King heating furnace, for either coal or wood, and with some special features covered by patent rights for the whole Dominion.

The Moffatt Stove Co., of Weston Ontario, who have offices and warehouse at 214 Princess street, exhibited a complete range of stoves and heaters.

The Doherty Mfg. Co., of Ontario, also showed their well known Decarbon steel stoves and heaters.

The Western Foundry Co., of Wingham, Ont., the western agent for whom is Mr. W. S. Black, 404 McIntyre Block, Winnipeg, had on exhibition samples of their furnaces and stoves especially adapted for the use of hotels and restaurants.

The Pease-Waldon Co., of 111 Lombard street, Winnipeg, had on view a good range of their goods, with a special display of heating furnaces. This company has just opened up in Winnipeg, and is carrying a full stock for the western trade.

The Enterprise Foundry Co., of Sackville, N.B., W. J. Copp, Son & Co., of Fort William, Ont., the James Smart Co., of Winnipeg, were also showing full lines of cooking and heating stoves.

The Amherst Foundry Co., Amherst, N.S., in addition to showing a range of furnaces adapted to all classes of buildings from the smaller house to the larger institution, had also on exhibition a fine selection of enameled ware for bath room and lavatory use, for which they have just completed a large and perfectly equipped factory.

The Canada Radiator Co., Limited, of Port Hope, Ont., showed a range of their positive circulating radiators, of which they claim they are the only makers, stating that no other maker has the positive circulation and the consequent absence of air accumulation which is the main feature in this make. It is also claimed to save at least 15 per cent. in consumption of fuel.

The Dominion Radiator Co., Limited, of Toronto, had a very fine and attractive exhibit of highly finished radiators, which drew a good deal of comment from the visitors.

An interesting exhibit was that of the Fairbanks Co., who in addition to the large display of their scales and other fittings shewed bath room and lavatory fittings.

The Siche Gas Co., who have an office at 483 Main street, had on view a range of generators in the centre of which was displayed a large generator with a capacity of some 250 lights.

NOTES.

The city of Winnipeg owns a valuable quarry of mottled limestone situated at Little Stony Mountain about five miles from the city. A deposit of clay suitable for the manufacture of fine pottery has been discovered on the Winnipeg river about 60 miles from Winnipeg. Clay suitable for the manufacture of a good quality of brick is abundant in the neighborhood of the city. Unfortunately this clay is not adapted to the manufacture of red brick.

The Board of Works of Winnipeg have recommended that the city enter into contract with an insurance company to insure its employees against accident. About $700 a year has been the average expenditure for wages to employees incapacitated through accident, and it is felt that this sum is likely to be increased by the fact that the city is constantly enlarging the scope of its operations. The cost of insurance would be about 90 cents per $100, or about $4,500 on an annual pay roll of half a million dollars. About half of this amount is proposed to be deducted from the workmen's wages.

The surtax levied by Canada on importations from Germany has cut seriously into that country's Canadian trade, but has considerably helped that of the British West Indies. For the nine months ending March 31st, 1903, Canadian importations from Germany amounted to nne hundred and fifty million pounds, while during the nine months ending March 31st, 1904, they amounted to but five hundred and thirty thousand pounds. In direct contrast to this reduction we find that the quantity of raw sugar imported from Guiana and the British West Indies increased from forty million pounds to one hundred and sixty-two million pounds in the same periods as mentioned above. A big decline has been noticeable in all other lines, the dutiable goods entering for the nine months ending March 31st, 1904, being $7,776,205, while at the termination of the similar period on March 31st, 1904, they have fallen to $5,076,383 a decrease of $2,699,822.

MONTREAL CITY AND DISTRICT SAVINGS BANK.

The building illustrated is the branch bank for which the foundations are now being excavated at the south-west corner of St. Catherine Street East and St. Timothy Street, Montreal.

The material of the facades is Deschambeau limestone upon a plinth of granite from the Stanstead Quarries. The building is fireproof the floors being of steel cased with terra cotta. The bank will occupy the ground floor and basement and will be entered by the doorway in the centre of the St. Catherine street front. The banking room occupies nearly the whole extent of the ground floor being 72 feet long and 43 feet wide. The space for public is in the middle with the counter in horseshoe form around it. A portion of the upper floors is occupied by the manager's house, the rest will be let as offices. The cost when completed will be about $70,000. The architect is Mr. A. H. Lapierre, Montreal. The builder is Mr. M. Huberdean of Montreal, the carpenter work being in the hands of Messrs. Labrecque & Mercure.

PARTICULARS OF THE SCHOLARSHIP ESTABLISHED BY THE PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS.

The Province of Quebec Association of Architects have had under consideration for the past two years, the establishment of a scholarship in the Architectural department of McGill University. At the last annual meeting, held in Quebec, the scheme for same was submitted, and by resolution of the general meeting, was adopted. By this resolution, the Province of Quebec Association of Architects, undertakes to pay the University expenses of a student, the beneficiary being selected after a thorough course of examination. The examination or competition will take place in the rooms of the Association (5 Beaver Hall on the 14th and 15th day of September next.)

The conditions laid down by the Province of Quebec Association of Architects, are to the effect that (a) Competitors must be bona fide members in the office of an Architect, a qualified member of the Province of Quebec Association of Architects and who is also a resident in the Province of Quebec, (b) He is also required to pass the preliminary examination of the Province of Quebec Association of Architects. (c) He is also required to have passed the matriculation examination of McGill University in the Arts course.

The successful competitor shall receive tuition free of charge, in the complete course for the Bachelor of Architecture degree at McGill University, this course lasting four years.

All particulars regarding the competition can be obtained from members of the profession, the Authorities of McGill, or the Secretary of the Province of Quebec Association of Architects, R. Lacroix, No. 5 Beaver Hall Square.

A NEW METHOD OF EXCAVATING.

A Chicago contractor has hit upon a method of saving the employment of several teams of horses to haul earth out of a deep excavation. The empty wagon is driven onto a platform at the street level, the horses unhitched and the wagon lowered into the excavation by a jib crane. When loaded it is again hoisted to the platform, the horses hitched to it, and it is drawn away. The loops of the chains by which the wagon is lowered and raised are passed through the spokes and over the hubs of the wheels to prevent slipping. By this method an excavation from 15 to 23 feet deep and 110 by 200 feet in extent, was completed in sixty days.

NOTES ON THE SUPERVISION OF BUILDINGS.*

By C. F. Innocent.

In this paper I have tried to express my views as to the general conduct of a young architect on a building, embodying such information as would have been useful to me a dozen years ago.

First, let me urge upon pupils the importance of getting on to work in progress as much as possible, as this is the way to obtain a practical knowledge of construction. If your principals would allow you to visit a building from commencement to completion, say, every day or every alternate day—to act, that is, somewhat as clerk of the works—you would be greatly benefited.

The person with whom you will have most to do is the foreman, and it in well for you to remember that he is placed in his position by the builder to look after his (the builder's) interests. Much useful information can be learned in conversation with an experienced foreman, and also with the better class of workmen, such as the joiners who are "staircase hands" and the masons who set the ashlar. If you should be appointed, as I have advised, to look after work, the foreman will soon take your measure; and if he thinks you are a likely fellow for it, will try to persuade you to alter all sorts of things—of course to improve the work; such, for instance, as the benefit to be derived from the substitution of lia-lime for cement in concrete; and if you are green enough he may make such substitutions without saything to you about them. Things will go more smoothly if you always stick pleasantly and firmly to your first decision; if you know that you are right, take no notice of the builders objections that such-and-such ways are unnecessary fads and that Mr. So-and.so always has it done in some other way; you will find it best to show at the beginning that you mean to have everything done well. And whilst on the subject of foreman I would remark that some builders have an inconvenient habit of moving their foreman about from job to job; this will cause you a great deal of trouble and should be objected to.

In condemning moterials you will of course order them to be removed from the site, and if you are wise you will see them go; unless this is done it is very easy for an unheeding workman to use up the stuff—of course quite by accident. If you do not see the goods removed you should at any rate remember their appearance thoroughly, and if possible plainly mark them as disapproved.

I believe that some undesirable builders consider that disapproved material is removed if placed on another part of the site: bew are of this. Then again, when the builder assures you that the materials are the best, he may be correct in the letter but wrong in the spirit, as "best" used as a trade term does not always bear its recognized dictionary meaning. The "best" in some materials may be of quite medium quality.

In work out of town, where the builder's unable to drop into the architect's office whenever he wants to ask a question, it is almost a necessity to adopt a regular day for inspection or to inform the builder before-hand of your visit; and I believe that some architects adopt this practice with their work in town: but in such cases it is of questionable utility, as it always enables the builder to have everything on the work ready for your inspection as he wishes you to see it, and there is the disadvantage of allowing the large force of men whom he has put on the work to gladden your heart on your visit of inspection to be transferred to another job when you are safely out of the way for a few days or so. Visits at all times and any time are the best to keep everyone on the qui vive. You know that as soon as the laborer who is mixing mortar or loading up bricks in the road sees you bearing down on the job he goes inside and shouts up to the scaffold that So-and-so, whatever your name or nickname may be, is coming; then the word is passed round, and by the time you have climbed upon the scaffold the bricklayers, who have been laying the bricks nearly dry except on the face joints, are laying them as carefully as eggs, and the masons who have been packing their walls with little stones without a scrap of mortar to cover them, have flushed them all up in what seems a most satisfactory manner—until you poke into it. I suppose it is natural for everyone to go the easiest way, and you will have an early example of this when the stripped soil on the site has to be tipped; you will find most excellent reasons produced for wheeling it down hill.

When you pay a visit to a building for the purposes of supervision it is as well to go around by yourself and not be led round by a talkative foreman; in such a case I sometimes feel that work is being smothered up on another part of the building while he is engaging me in conversation; of course, it is a different matter if you go to learn what you can from him, as suggested before, and I may say here that it will be as well to ascertain from your principal what is your standing on the work. No doubt you will realize that the condemnation of work or materials by an inexperienced pupil sometimes places the architect in such a position that it is necessary to let the pupil down.

It is obviously impossible for me to describe here the numerous probable defects in the various works and materials. This has already been done in such standard works as Seddon's "Builder's Work and the Building Trades" and "Notes on Building Construction"; and various excellent articles have been published in the architectural papers. There is one point, however, which I consider does not receive adequate consideration in the text-books, that is, the correct order in which the different trades and operations follow each other. These are well known by the builder, but he does not always act up to his knowledge, considering his own convenience; sometimes, if permitted to do so, for instance, he may build the walls in one part of a building before those in another part, with unequal settlement as a possible result, or he may rush the concrete floors on while a shower of sawdust is descending from the joiners working at the roof, thus weakening the concrete; or the joiner may bridge or strut the joists as soon as they are fixed, so that the fastenings are strained with each swelling and shrinking of the timber; or a laborer with nothing to do may be set to sweep up the rubbish while the painters are varnishing, thus producing a fine frosted effect without extra charge; or various works may be delayed perhaps in the hope of slipping them all together. On contract work each tradesman usually wishes to change his men around as little as possible, to keep them at regular work, and to go straight forward and get as much work finished as is possible at one time.

I will now run through such other matters in the work requiring your attention as occur to me.

As to the commencement, some architects set out the work themselves, and others refuse to do so, but check the dimensions after the builder has set out; this is necessary because you will understand what a saving an unscrupulous builder would effect if he were to pinch 2½ in. or 2 in from each dimension of each room. The rooms should also be tested to see whether they are square. Whether the walls are at right angles may be easily tested with the measuring tape if you remember that the sides of a right-angled triangle are in the proportion of 3, 4 and 5, and their multiples of course. The heights of the rooms should also be tested.

You are not likely to be troubled much in Sheffield with bad foundations, though here and there are quicksands, in which cases the pump and concrete are a necessity. As clay is liable to swell when wet and contract when dry, with unpleasant effects to the building, you should have the footing ready before rain gets to the work. If the footings are of rubble it is necessary to see that they are well bedded on the foundations and well compacted together. Poor footings lead to subsequent cracks in the superstructure.

While speaking of the foundations I would remind you that they are occasionly omitted in places where

* Extracts from a paper read before the Sheffield Society of Architects and Surveyors.

the building inspector can be squared or where he has not yet put in an appearance.

When the drains are laid the laborers very often start to ram the filling as soon as the first portion is thrown in, with cracked pipes as a possible result; this should not be allowed. It should also be seen that pipes are clear inside especially from cement filling. In places where there is much filling, water from a hose may be used with advantage to supplement the rammer.

The mortar is a most important ingredient in a building, and as the builder naturally dislikes to waste any, the spare mortar a day or two old is very often reworked up and used in the work; as, however, its setting powers are then impaired this is not satisfactory, and you should watch and prevent it. Good mortar ought to feel greasy betweeu the fingers and dry limey on them. A builder's rough test for mortar is to take some up on a shovel and turn the shovel over; if it runs off easily he considers that it is of good quality and vice versa. In practice, poor mortar which works off stiff (by reason of the too great proportion of sand) is wetted to make it work more easily, and it is then deceptive; the waller finds mortar with poor sand (that is, lomey and clayey) most easy to work with. The lime used for mortar should be in lumps which ring when struck together. If it is sott or fallen to powder it has probably been rained upon or slaked by the moisture in the atmosphere, and should not be used for mortar.

In mixtures where lime or cement are ingredients there is a tendency, owing to the greater proportionate cost of these materials, to put in a less quantity than specified, and whether you have doubts or not it is advisable to personally watch over the mixing—especially of concrete, where the strength may be of importance; the proportion of cement may be reduced under your very eyes by the labourers putting the box for measuring the cement unto the heap of stones and sand and knocking it down, thus forcing some of the stones up into the measuring box and reducing the amount of cement. Mortar should not be allowed to set too fast (or rather too dry) and in hot weather the bricks should be well soaked in water; such wet bricks are heavier and handier to the bricklayer than dry bricks. Concrete is also not improved (but the reverse) by drying, as may take place with floors in windy weather, so that it should be kept damp until it has set. You will of course see that the bricks are properly bonded especially at angles, in reveals and jambs, and in piers. A well-bonded brick wall is much more satisfactory in appearance than one in which the joints are not perpendicular and the bricks cut about; in this respect the old eighteenth-century brickwork, where the piers and openings are all multiples of a brick, is superior to much modern work, where the piers and openings are set out on a drawing to a scale of feet and inches and the bricks have to be cut to fit.

In the walling of flues, a matter which needs careful attention is not to "throttle" them, because this is one of the most usual causes of smoky chimneys; particular attention should be paid to the flues at the bends to see that they are kept large enough; as the necessary bends themselves impede the smoke, you should see that the men in walling do not make them smaller at the angles, as they have a habit of doing.

Inferior workmen are very careless about keeping woodwork or steel joists properly away from flues and fireplaces; many fires have been caused by this, and you must carefully guard against it. There are still builders in this district who lay the joists, then build the flues around them as they come, afterwards cutting off the pieces of joists which run across the flues, leaving the ends of the joists exposed.

You will have learnt that stone should be laid in the work upon its natural bedding-plane or "quarry bed." A good way of ascertaining the bed of a stone is to douse it with water. The beds worked by the mason requires your attention to see that they are level and of full size, otherwise pieces may flush. It is rather expensive and troublesome sometimes for a builder to replace a piece of ashlar which has got chipped or otherwise damaged, and it is possible for him to patch it up very neatly and inconspicuously with cement; and I understand that very up-to-date masons stick the chip on with shellac and sand the joint, all with unfortunate results later. Keep your eyes open for this.

Some inferior builders, in order to save scaffolding on the work, only put it up on one side of the wall; this necessitates what is known as walling "overhand" and should be objected to, as it is almost impossible to plumb up the work properly; of course in some cases this one-sided walling is necessary. You should regularly plumb thewalls, as those out of plumb are unsightly and may be unsafe; besides the joiner and the plasterer cannot make a good job with them. Another point to attend to in walling is to see that the scaffolding is raised in easy stages for the wallers: some men neglect this, to the detriment of the walls. These are little ways in which the builder may effect savings that keep money in his pocket and add of course to his balance on the right side. Similar things occur in all trades—in the carpenter's, for instance, as giving all the bearing timbers an inch or so less of bearing at each end, or by making the roofs of a flatter pitch than shown on the drawings (which is easy in a hipped roof) or by setting the joists of wood or steel an inch wider apart than taken,, or by systematically omitting one joist in each room; such omissions all add up.

The ordering of extras is important, and I must warn you to be careful of what you say, as builders sometimes put their own interpretations on your innocent expressions of opinions, and when the bills comes in and your principal asks the builder who ordered such-and-such an extra, the builder, looking in his pocket-book, says, "Oh, your Mr. So-and-so ordered it on such a date"; and the results may be unpleasant for everybody. It is best for the builder ty understand that the architect alone can order extras.

I have previously pointed out the importance of seeing work carried out, and I would here emphasize the importance of getting round the builder's shops in addition to the building itself, as without a good acquaintance with workshop practice you will hardly be able to draw workable details. I have seen sections drawn for local sandstone which could only be worked in wood, or perhaps in marble, and every builder has tales of impossible details that come out of architect's offices. Not only are such visits to shops desirable for the acquisition of knowledge but they are necessary in the case of joinery, as the first coat of paint, known as the priming coat, is usually put on in the joiner's shop, and all kinds of defects may be covered up if not seen before being painted.

The principal points to notice in the joiner's work at the shop are the quality of the timber (especially as to sap and seasoning), bad joints, and the omission of labour, as in grooving and rebating, and to see that the framing is square and not winding on its faces; also, if detail drawings have been used, to see that the work as regards mouldings, framings, panels, etc., has been carried out in accordance with them. The quality of timber gets poorer as the years go by.

The places where things are most likely to be forgotten (as I will put it) are those which are dark and difficult of access, more especially the roof. I would urge you to climb up and see whether the spars and purlins and the other timbers are all properly spiked together. A client usually notices things which, though structurally unimportant, render, if not rightly built, the "very very pretty house" desired by some people unobtainable, and they should be carefully attended to—such as the quality of paint and varnish, the centering of fireplaces and windows in walls, the fitting of window sashes, and the squareness of joiner's work, irregularity in which interferes with the correct fitting of wallpaper patterns. In setting out, joiners work up to eighths of inches but consider 1/16 in. infitesimal. Bricklayers and masons do not expect to take into consideration less fractions than half inches.

The roof coverings require careful watching. Slates from the better-class quarries have not been very easy

to get lately, and unless you early bestir yourself you may be driven to accept inferior slates. Of course you will understand that with materials which have to be obtained some time before they are used in the building there is sometimes a likelihood of the builder using them for other jobs before yours is ready for them, and this may prove awkward. If the slates are to be to sample, it is as well to make sure that they are so; this, of course, applies to all other materials to sample, especially the bricks and the joiner's ironmongery.

As the slating is only a small trade I propose to consider it more completely than the others, as a type of the supervision required for all trades. The first thing to look to is the quality of the slates; they should be both hard and tough, they should have a metallic ring when struck with the knuckles, and should not fracture easily when lightly struck against wood; it water poured on the slate is soon absorbed, the slate is of course porous; slates with friable and splintered edges are generally bad; slates with green blotches in them (though the blotches do not effect the weathering qualities) are about £1 per ton cheaper than plain slates; slates get shaken on their railway journey, and if not properly packed a jolt in shunting may sometimes crack them from end to end of the truck. The slater should test every slate for soundness before holeing it, which he does by striking it on a bar in front of him or by sharply tapping it with a hammer; cracked slates, however slight the cracks are, should not be put on, as frost is sure to crack them completely. The holeing of the slates determines the lap, and this is one of those matters where a squeeze of ¼ in. will put something in the contractor's pocket. The nail-holes should not be so large that the slate will draw over the nailhead. In holeing, the slate sometimes breaks around the holes, and it not stopped the slater may turn and hole again; no slates which are broken or much chipped should be allowed. The laborer may so hole the broken slates that the broken end is hidden, when laid, by the upper slate, and there is then only one thickness of slate covering the roof at that point. The laths should be free from sap and nailed to every spar. The roofs should be lined over before lathing, and any spars which are down, or appear likely to sag, should be attended to. The slates should of course be slightly tilted towards the roof at a gable unprotected by a coping and the spars firred out before laying; the slates if in the least uneven should be sorted into thicknesses so as not to be laid at random, and any which are twisted should be rejected, as they certainly ride, although the slater sometimes says, "Oh, they'll be all right, we put the flat side downwards." Of course the heavier slates should be laid at the bottom. The double eaves-course is sometimes slipped, and if it is not the two bottom courses are sometimes nailed to a single lath. Nails, if expensive, (such as copper nails), are another matter in regard to which the slater may try to save something. Sometimes you will find nails of two weights on a job, one as specified and the other lighter. I confess that I offer no explanation of this, and fear that you will not obtain a satisfactory answer from the slaters. The nails should bulge out somewhat in the middle to get a firm hold on the lath. The joints of the slates should be virtually over each other for the sake of appearance. Occasionally there is a tendency on the part of the slater to delay the pointing of the slates until after the ceilings are plastered, on the principle I suppose that what is of sight is out of mind.

The pointing mortar should be haired or it will not stick to the underside of the laths, and some slaters do not put the the hair unless supervized; it is also a trouble to point the verges, and ordinary cement-mortar specially to point the the verges, and ordinary lime-mortai will be used if you are not careful. The ridge-niles should be set and pointed in cement-mortar, and, if flanged, the flanges should be away from the south and west in order to avoid giving a purchase to the gales from those quarters. The angle inside the ridge should be less than the rake of the roof, so as to grip it more firmly.

I have already advised you to keep your eyes on the mixing of the plaster and need not say more on the subject, except that you should satisfy yourself that the lime is well slaked. Sometimes the plasterer finds it easier to fill up a space by laths in a different direction to the rest; the plaster at such points will possibly crack, so that you should not allow him to do this. Plaster on laths should be well "keyed"; that is, squeezed between and behind the laths. I have had it explained to me by a plasterer where the key on some stoothing was absent that a key on lathed upright partitions was as unnecessary as on walls, there being no pull from the plaster, as on ceilings; but that plasterer did not make a convert, and I name the incident as an example of the numerous good reasons for doing bad work which are constantly being brought forward. It is surprising how monotonously sap and other defects in laths are declared to be "only a little stain." Of course in some cases what at first looks like sap proves to be only surface dirt.

You will find a source of considerable trouble and annoyance in the independence of some trades and the ignorance of some workmen. I refer to such matter as the cutting of bearing timbers by plumbers and gas-fitters and their kind, who, unless you warn them beforehand, will chop right through your bearing timbers without compunction if it suits them to run their pipes in such ways.

The plumber is such a monster in the popular imagination that you will be pleased to find him, on the whole, neither better nor worse than his fellow-tradesmen. However, should he be so inclined his opportunities for taking advantage of you are many, especially in the lead in gutters, flashings, ect., which should of course always be tested for size, lap weight and fall, as all of these are liable to be skimped. Also, the plumber is able when cutting the lead to give a twist with his knife which thickens the edge, so that it is better not to rely on the lead gauge but to weigh a bit of the lead and to calculate the weigh therefrom. The eaves-gutters and down-pipes should also be inspected for correct and even thickness.

The painter's trade is one of the most difficult for the architect to exercise supervision over the materials. I recommend you to make a study of these. It is well to have each coat of paint of a different shade; of course the variation need only be slight, but if you see each shade on everywhere you know that all the coats are on. This refers more especially to the constructional steel-work, where a coat is often slipped.

We have all heard of people who could not open a single window when they went into their new building and could not get the architect to attend to it for three days. Therefore, before the client occupies your building I advise you to go round and see that the sashes are not stuck with paint, that the window-fasteners work properly, that none of the keys are missing, that any damage slates are repaired, that the eaves-gutters are clear of rubbish, and (not least in importance) that the w.c. cisterns are in working order. These little things, if left imperfect, make a new building unpleasant for its occupiers and may lead to accusations of neglect on the part of the architect.

My notes must here end. But I must not conclude without saying that they do not apply to the better class of builders, with whom I hope that you will only have to deal. And as a final word of advise let me say, do not fall off the scaffold.

Colour is not merely necessary for our pleasure, but is an actual physical necessity. Absence of colour would mean the gradual deterioration of the eyes and eventual blindness.

One day the great architect Richardson was approached by a man who had only $1,500 to spend on a house. The difficulties of the problem appealed to Richardson so strongly that he took hold with zest. It put him on his mettle to produce an artistic result from purely structural conditions. But when the client announced that he could afford $3,000 he was dismissed with a wave of the hand. The great man's interest was gone.—Country Life in America.

STRENGTH OF WOODEN PILLARS.

The Building By-law for the regulation of the construction of buildings for Toronto, as prepared by the city architect, Mr. McCallum, contains a number of formulæ for the strength of pillars and beams, which we find have been worked out in tabulated form by Mr. John S. Fielding, C.E. M.E. of this city, who has been consulted by some of the leading architects in regard to this matter.

The tables cover the formulæ on pages 43, 44 and 45 of the building by-law No. 4408, as passed July 6th, 1904, and on this page we present table B which gives the breaking loads and safe loads in square wooden pillars as allowed by Kidder, Trautwine and C. Shaler Smith, for white pine, long leaf yellow pine and oak, and compares same with the safe loads allowed by the city architect in pillars of long leaf yellow pine.

Column 1 gives the size of pillar; column 2 gives length of pillar; column 3, the breaking load in tons of 2240 lbs. each, and the breaking load in pounds; column 4 gives safe load at the factor of safety of 4 recommended by Kidder for yellow pine or oak; column 5 gives safe load at factor of 6 recommended by Kidder for white pine; column 6 gives safe loads allowed by the city architect for yellow pine.

1	2	3		4	5	6	1	2	3		4	5	6
SIZE	LENGTH OF COLUMN	BREAKING LOADS C = 5000 C.S. SMITH		SAFE LOADS Y. PINE AND W. OAK C=1250 KIDDER	WHITE PINE C=833 KIDDER	LONG LEAF Y. PINE C=1100 MCCALLUM	SIZE	LENGTH OF COLUMN	BREAKING LOADS C = 5000 C.S. SMITH		SAFE LOADS Y. PINE AND W. OAK C=1250 KIDDER	WHITE PINE C=833 KIDDER	LONG LEAF Y. PINE C=1100 MCCALLUM
		TONS	LBS.	LBS.	LBS.	LBS.			TONS	LBS.	LBS.	LBS.	LBS.
6×6	6'-0"	51.0	114,240	28,560	19,040	25,124	6×6	16'-0"	15.8	35,390	8,850	5,890	7,770
8×8	"	108.	241,920	60,480	40,320	53,163	8×8	"	43.2	97,220	24,300	16,200	21,310
10×10	"	184.4	413,060	103,260	68,840	91,120	10×10	"	90.4	202,500	50,620	33,750	44,460
12×12	"	281	629,440	157,360	104,910	138,460	12×12	"	158.8	355,710	88,930	59,300	78,250
14×14	"	394	882,560	220,640	147,090	194,960	14×14	"	250	560,000	140,000	93,330	123,020
16×16	"	526	1,178,240	294,560	196,370	260,490	16×16	"	363	813,120	203,300	135,520	178,670
6×6	8'-0"	39.7	88,930	22,230	14,820	19,565	6×6	18'-0"	13.0	29,120	7,300	4,850	6,400
8×8	"	90.8	203,400	50,850	33,900	44,660	8×8	"	36.6	81,990	20,500	13,665	17,980
10×10	"	163.2	365,570	91,390	60,930	80,410	10×10	"	78.	174,720	43,680	29,120	38,370
12×12	"	255.1	571,420	142,860	95,240	126,115	12×12	"	140.	313,600	78,400	52,260	68,980
14×14	"	367	822,100	205,520	137,000	181,500	14×14	"	224	501,760	125,440	83,620	110,440
16×16	"	500	1,120,000	280,000	186,660	246,150	16×16	"	331	741,440	185,360	123,570	163,480
6×6	10'-0"	30.9	69,216	17,300	11,530	15,230	6×6	20'-0"	10.9	24,420	6,100	4,070	5,350
8×8	"	75.3	168,670	42,160	28,110	37,050	8×8	"	31.1	69,665	17,410	11,610	15,300
10×10	"	141.8	317,630	79,410	52,940	69,795	10×10	"	67.6	151,425	37,850	25,240	33,300
12×12	"	229.5	514,080	128,520	85,680	113,135	12×12	"	123.6	276,864	69,220	46,140	60,918
14×14	"	339.	759,360	189,840	126,560	166,680	14×14	"	201	450,240	112,560	75,040	99,100
16×16	"	466	1,043,840	260,960	174,000	229,900	16×16	"	301	674,240	168,560	112,370	148,200
6×6	12'-0"	24.3	54,432	13,610	9,072	11,980	6×6	22-0	9.2	20,610	5,150	3,430	4,660
8×8	"	62.5	140,000	35,000	23,330	30,660	8×8	"	26.8	60,030	15,010	10,000	13,140
10×10	"	122.3	273,930	68,430	45,680	60,140	10×10	"	59.0	132,160	33,040	22,030	29,050
12×12	"	204	456,960	114,240	76,160	100,500	12×12	"	109.5	245,280	61,320	40,880	53,944
14×14	"	307	687,680	171,920	114,610	151,490	14×14	"	182	407,680	101,920	67,940	89,990
16×16	"	432	967,680	241,920	161,280	212,630	16×16	"	274	613,760	153,440	102,300	134,800
6×6	14'-0"	19.4	43,456	10,860	7,244	9,575	6×6	24-0	7.9	17,700	4,420	2,950	3,880
8×8	"	51.9	116,260	29,065	19,370	25,465	8×8	"	23.2	51,970	12,990	8,660	11,385
10×10	"	105	235,200	58,800	39,200	51,670	10×10	"	52.	116,480	29,120	19,410	25,480
12×12	"	180.2	403,650	100,910	67,270	88,800	12×12	"	97.3	217,950	54,490	36,330	47,940
14×14	"	277	620,480	155,120	103,410	136,800	14×14	"	163	365,120	91,300	60,850	80,880
16×16	"	397	889,280	222,320	148,210	195,415	16×16	"	249	557,760	139,440	93,000	112,650

Note—Trautwine quotes C. Shaler Smith's breaking loads for moderately seasoned white and common yellow pine, with flat ends, firmly fixed, and equally loaded, as per column "3". The formula being $B = \frac{AC}{1+\frac{L^2}{3000D}}$ with C = 5000 as per Kidder also quotes from C.S.S. and gives same breaking loads, and recommends the use of a factor of safety of 4 for oak and yellow pine or C = 1250 See col. "4" and of 6 for white pine or C = 833 " " "5" Column "6 gives Mc. Callum's requirements for Long Leaf Yellow Pine Square Columns.

PREPARED BY JOHN S. FIELDING C.E. M.E. etc.

BREAKING LOADS AND SAFE LOADS ON SQ. WOODEN PILLARS
C. SHALER SMITH - TRAUTWINE - KIDDER - MCCALLUM

SHEET - B

These tables should prove very convenient for all architects and builders and should save a good deal of calculation.

The full set may be seen at this office, and Mr. Fielding is willing to supply them to any architect who may be interested.

According to the figures of the labor bureau at Washington, there have been in the last 20 years more than 22,000 strikes, involving a loss to employes and employers of over $400,000,000. The loss to the workmen themselves has been more than twice that of their employers.

—THE—

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Experiments were recently made in England to determine the relative strength of hand-made brick and machine-made brick, with the following results: The machine brick were dried in a drier and kiln burned, and had an ultimate strength of 197.7 tons per square foot. The hand-made brick had an ultimate strength of 125.9 tons per square foot. At those weights they were crushed. The machine-made brick showed an absorption of 7.83 per cent.

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Glenyards Fire-Clay Co., Ltd., Bonnybridge, Scotland, fire bricks for all purposes.

Thos. M. Camm, stained glass, plastic relief, ecclesiastical fittings, Smethwick, nr. Birmingham, Eng.

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Sam Deard, Ltd., Old Broad St., London, E.C., patent glazing.

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Moderate breeze	,, 18	,, ,,
Fresh breeze	,, 23	,, ,,
Strong breeze	,, 28	,, ,,
Moderate gale	,, 34	,, ,,
Fresh gale	,, 40	,, ,,
Strong gale	,, 48	,, ,,
Whole gale	,, 56	,, ,,
Storm	,, 66	,, ,,
Hurricane	,, 75	,, ,,
	,, 90	,, ,,

It has been calculated says a writer in The Builders' Journal, that the Colosseum at Rome accommodated 100,000 people. The height is given as from 160ft. to 180ft., but the tiers of seats inside did not rise to more than about half this height, the space above being necessary for ventilation. When such enormous crowds were packed closely together for several hours at a time on an Italian summer day, with an awning drawn over them, the atmosphere would have become pestilential if there had not been a considerable space overhead, and at least one range of open arcades for the free circulation of air.

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BY THE WAY.

There is some talk in Toronto of appointing a supervisor of elevators. With a view to furthering the security and safety of the thousands of people who daily patronize the elevators of New York, the Superintendent of Buildings of that city is now formulating a plan for inspecting, licensing and badging elevator men. In New York there are 6,000 elevators.

× × ×

It is said that some one expressed in the presence of Cobden "the hope that some day all people might become intelligent enough to read Bacon." To this Cobden replied: "I would be happy indeed if the time ever came when all the working people could eat bacon." This was said some sixty or seventy years ago. The time has surely come when the working people not only eat bacon but also read Bacon.

× × ×

Almost every day sees evidence of some new use for concrete. So vast are the uses that it has already been put to that to-day, as stated by the Canadian Manufacturer, we are walking on it, riding on it, eating our daily bread from grain stored in concrete elevators, taking our drinking water from concrete reservoirs and cisterns, living and doing business in houses constructed of concrete, sanitating our cities with sewers of concrete, and last, but not least, enterprising undertakers are offering us the opportunity of taking our final rest in concrete burial cases, deposited in concrete tombs, surmounted by concrete monuments, sacred to our evanescent memory.

The Foundation-stone of the new Liverpool Cathedral will be laid by King Edward on July 19th.

BUILDING STRIKE IN TORONTO.

The expectation that the present building season in Toronto would be entirely immune from strikes has met with disappointment. As this number goes to press building operations in that city are almost at a standstill consequent upon a strike of the union laborers for an increase of wages from 25 to 28 cents per hour, and the decision of the bricklayers' union to support the strikers by refusing to accept material from non-union laborers. The Builders' Exchange have positively declined to grant the laborers' demand, so there exists a deadlock, which unless broken, must seriously hamper business enterprise especially in the burned district, and spoil what would otherwise have been the most active building season in the history of the city.

LEGAL.

CHRISTIE v. COOLEY.—Judgment by Justices Meredith and Teetzel in thd Divisional Court at Toronto, on appeal by defendant from judgment in County Court of Hastings in favor of plaintiff in action to recover possession of a strip of land 4 feet wide, situate in the town of Trenton, part of lot 5 on the east side of Water street. In 1883 there was erected on lot 5, which has a frontage of 66 feet on Water street, a three-storey brick building divided into three stores. The northerly part of the lot had been purchased by plaintiff from one Gordon, the remaining part being retained by Gordon, and the buildings on it, and so much of the part sold to plaintiff as was used or intended to be used as an hotel called the Hotel Aberdeen. In the conveyance from Gordon to plaintiff there was a clause by which plaintiff authorized and empowered Gordon to appropriate and use a longitudinal strip of land along the southerly side of the 25 feet conveyed of about 4 feet in width, for the purpose of erecting a suitable building, "this grant to remain in force only so long as the said building so to be erected shall remain standing on the said 4-foot strip, and no longer." The building was put up, and in 1899 was seriously damaged by fire. Held, that the building not having been entirely destroyed by fire, must be taken to have remained standing on the strip, and plaintiff was not entitled to recover.

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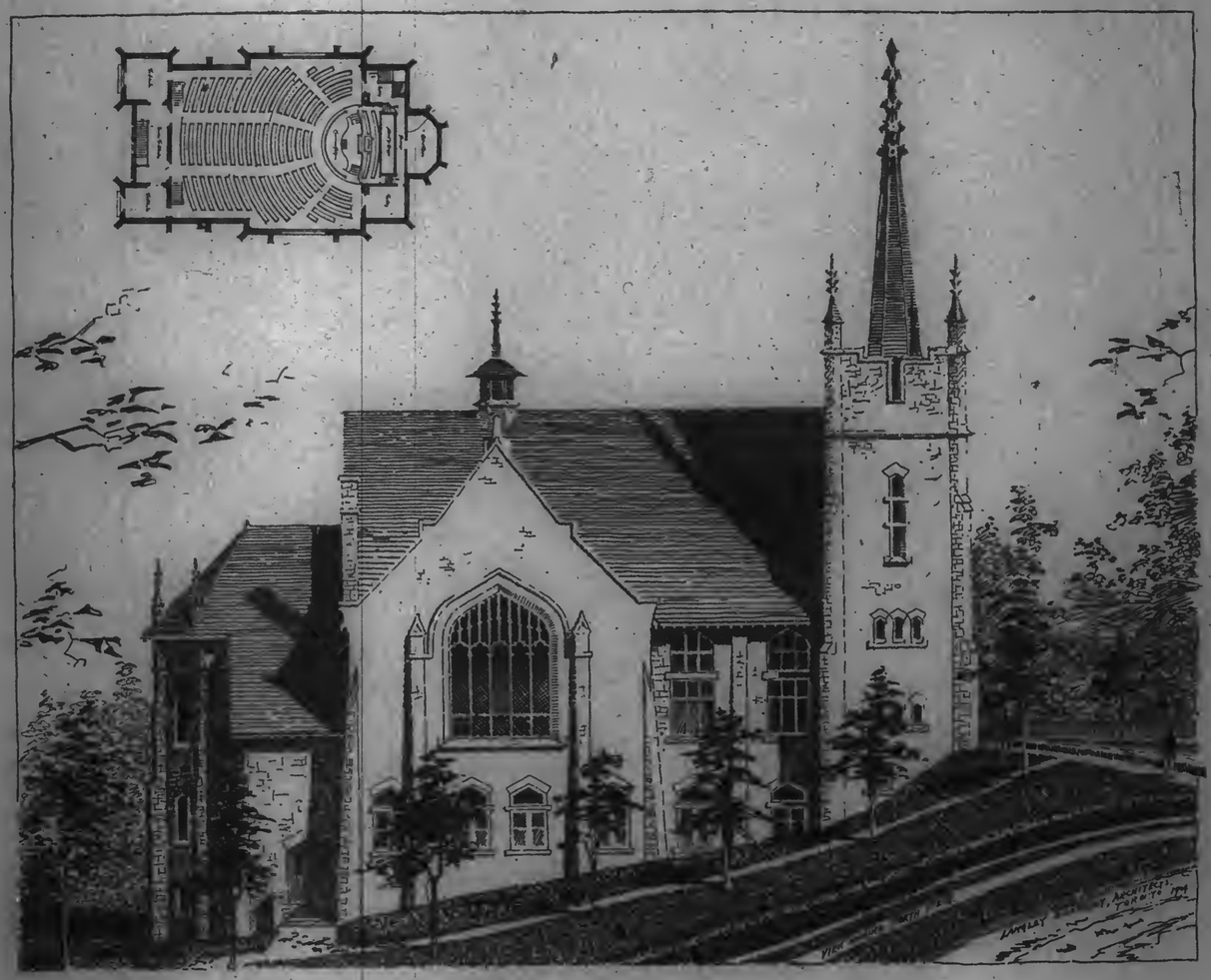
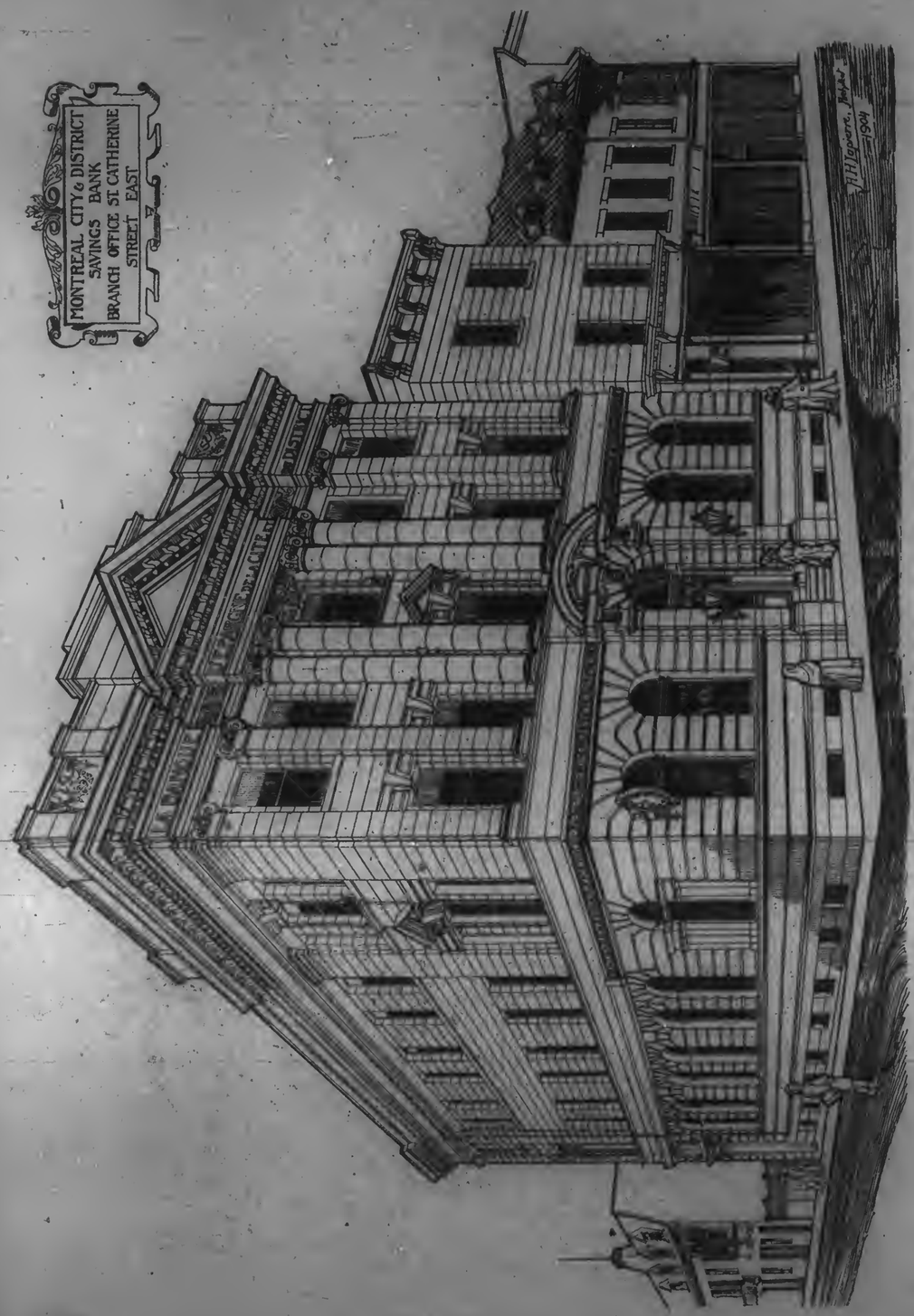


METHODIST CHURCH, PORT ARTHUR, ONT.
LANGLEY & LANGLEY, ARCHITECTS.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
AUGUST, 1904



MONTREAL CITY AND DISTRICT SAVINGS BANK BRANCH OFFICE, ST. CATHERINE STREET, MONTREAL.
A. H. LAPIERRE, ARCHITECT.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
AUGUST, 1904

CANADIAN ARCHITECT AND BUILDER.

BRANCH OF BANK OF TORONTO, KING STREET WEST, TORONTO.
CHADWICK & BECKETT, ARCHITECTS.

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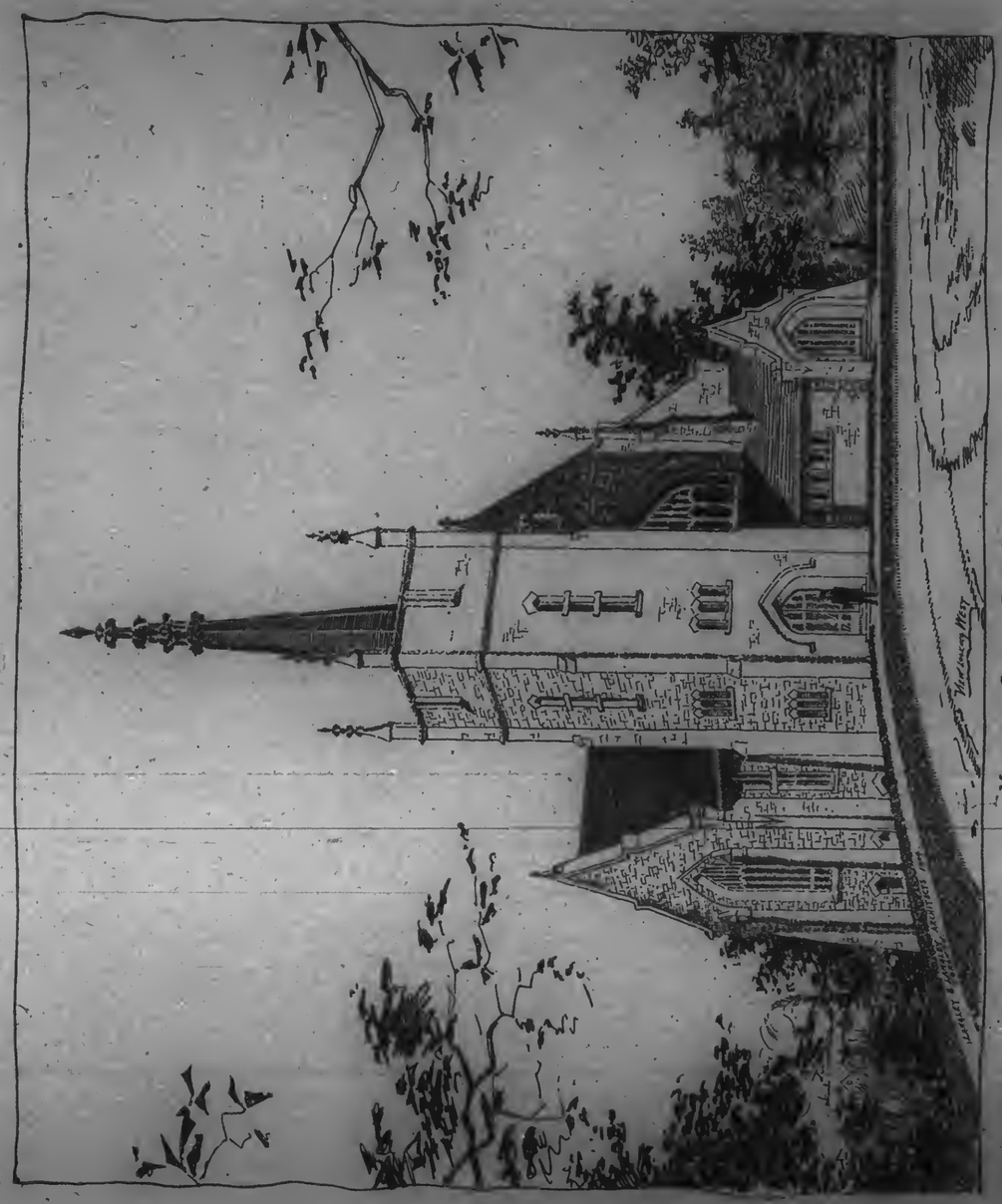
BRANCH OF BANK OF TORONTO, KING STREET WEST, TORONTO.
CHADWICK & BECKETT, ARCHITECTS.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
AUGUST, 1904

EXAMPLES OF COLONIAL DOMESTIC ARCHITECTURE, FREDERICTON, N.B.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
AUGUST, 1904



METHODIST CHURCH, PORT ARTHUR, ONT.
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The Canadian Architect and Builder

VOL. XVII.—NO. 201. SEPTEMBER, 1904.

ILLUSTRATIONS ON SHEETS.

Maxwell Farm, an Elizabethan Farm House (on the right) added to (on the left), by Mr. Seth Smith.
Store Building at Halifax, N. S., Built Entirely of Concrete —R. A. Johnson, Architect.
Lodge for Western Art Association, Brandon, Man.—W. N. Lailey, Architect.
Plans of Lodge of Western Art Association, Brandon, Man.—W. N. Lailey, Architect.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Union Bank, Winnipeg, Man.—Darling, Pearson & Over, Architects.
Head Offices of the Bank of Montreal, Montreal, Recently Remodelled.—McKim, Mead & White and Taylor, Hogle & Davis, Associate Architects.

CONTENTS

Editorial	145-146	Wallpapers and Hangings	158
The Architectural Association and Its Works	147	An Entirely Concrete Building in Halifax	159
The Toronto Building Strike	148	Publications	159
Northwest Letter	149	A Correction	ix-xiii
Plaster Decoration	150-151	Personal	ix
Design	152	Plaster and Stone	x
The McClary Mfg. Co.'s New Works at London, Ont.	153-155	Dangerous Cornices	x
A Rhapsody of the New Art	156	Useful Hints	xi
An Extraodinary Feat in House Moving	157	Legal	xii

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" A. F. DUNLOP, R.C.A., Architect, Montreal.
" FRED. T. HODGSON, Architect, Collingwood, Ont.

Improvements for Toronto.

The embodiment in the report of the Toronto City Engineer, recently published, of two suggestions that have been made for the improvement of Toronto—suggestions of a couple of diagonal thoroughfares and of a lake front drive— mark that these propositions have at last reached, or are on the verge of reaching, the region of practical politics. The diagonal streets, when they are accomplished, will be one of the greatest improvements made in Toronto since it grew to be a big place on a plan that is only suitable for a small one.

There is no time like the present for a work of that kind since freedom from costly obstruction is so necessary. "At present," the City Engineer says, "there are no expensive buildings on the line of the proposed avenues." But, if the suggestion underlying this statement is that it is a necessary condition that the proposed avenues should be straight from one end to another, we could almost wish there were expensive buildings on the line; not enough to daunt the promoters, but enough to make it necessary that the avenues should have what would be a great advantage to their beauty and interest—vistas of moderate length terminating with a building, and having at that point the refreshment of a bend of some kind. College street, though of no startling beauty in its present state, offers, between Spadina avenue and the west, suggestions of how little obstruction a slight bend is in a road, and how much pleasanter it is to travel over when varied by even such slight curves as these; and, as to the question of vistas, the view from about Euclid avenue looking east to Spadina avenue, where the tower of the Broadway Tabernacle rises as a central object in the road, is far better than the interminable vistas of King or Queen streets.

We have at last discovered that constant right angles do not make perfection in laying out streets; let us go a step further and abandon the bee line too. We all want to get home as soon as possible, but there is no reason why we should not enjoy the process of getting there if we can. That a street should here and there deviate from straightness adds practically nothing to its length and takes much from the fatigue of traversing it. It is direction that is the essential consideration in a street. For this it is worth while to take pains and, if necessary, pay money; but to suffer over making a street straight, or to suffer the want of it because it cannot be made straight, is to suffer in vain, for straightness is neither necessary or desirable.

As to the lake front drive, from Queen's wharf to the Humber, it seems to be all advantage; even the making is a gain. As long as the street commissioner has innumerable cart loads of ashes and other stuff to dispose of, and no where in particular to put them, no inequality of ground is safe from his necessities; and to create a safe dumping ground for him, which will ultimately turn out a boulevard, is a happy state of affairs, equal to Sidney Smith's account of the cooking of oat meal water: "She put some dirty water in a pot and by the blessing of God it came out a pudding." And by the time this boulevard is made, perhaps the City Council will have in sight a destructor which will settle the question as it ought to be settled and has been settled elsewhere, by burning up ashes, rubbish, garbage and tin cans all together, making of them a slag harder and better than stone for making and mending the roads.

Lessons from the Toronto Fire.

The General Committee of Fire Insurance Companies have published a report which is a rather dry statement of facts conveying, however, one or two practical lessons. There is the usual complaint about the interference of overhead wires with the work of the firemen, which it is as well to keep in mind until these wires are put underground; but there are two or three practical lessons which ought to have immediate effect in influencing the manner of rebuilding the warehouses that have been destroyed. The most striking suggestion may be extracted from the account of the "Sprinklered Risks," viz: the warehouses of W. R. Brock & Co., Kilgour Bros., and the Evening Telegram. The two former were supplied with both inside and outside sprinklers, and the evidence seems to show their efficacy if the flow of water can be kept up in spite of the competition of the hydrants. There seems to be no doubt that in the case of W. R. Brock's building, if there had been fewer hose going, if the fire had been concerned only with its immediate neighbour, this warehouse, though exposed to precisely the same contact with fire as in the April fire, would have escaped burning; but in a conflagration which kept 50 streams of water running and reduced the pressure at the hydrants from 70 or 80 pounds per square inch to 37½ pounds, the water curtain from the outside sprinklers, which kept the fire off while pressure lasted, began to fail in the upper stories; "then," the report says, "it is supposed that the fire entered the risk through the upper windows at the rear." The automatic sprinklers inside kept the fire in check until the tank supply was exhausted, after which the supply to the upper floors ran dry inside as well as outside and the fire got possession of the building.

The account of the Kilgour building's apparatus is not so clear. It had the advantage of a larger tank supply for the inside automatic heads, and the outside heads are said to have had a steamer connection auxiliary to the supply from city pressure; but it is not said whether the steamer connection was made use of, or whether the safety of the building, and the credit which is due to it of having stopped the fire at that point is due to its superior apparatus or to the good fortune of having had as its exposing neigbour on its uninjured side, a lower building than the Brock warehouse had. One point is clear, that, where the building did take fire, its advance within was held in check by "good division walls;" but that is a precaution well known, however little used. The immediate example furnished by these buildings is the efficacy of sprinklers if their efficacy is secured, and the simplest way to secure it would be to supply these, as well as hose pipes, with water from the fire engines. It would require a point of application at a comfortable distance from the fire; not up a lane but on the street; and on the edge of the sidewalk rather than against the building.

The Telegram building, though sprinklered, did not get to the point of opening the heads. The fire was successfully fought with inside hand hose, and special mention is given to good work done with a length of hand hose attached to a roof hydrant. This sounds like a good thing to have but not to rely upon. It is good to stop small beginnings, but the flame that reaches across a street would make short work not only of a hand hose but of those who operate it.

A second lesson is that a longitudinal fire wall hinders only a transverse fire; and a transverse approach is no longer the only thing to be expected from fire. Buildings are now so much higher than formerly, in relation to the width of the road, that it is only a question of the direction of the wind whether the flame from a burning warehouse will attack its adjacent neighbour or its neighbour across the street. Fire walls should run all round a building and the roof drain to the middle.

The great lesson of the fire, however, is one that was taught before, when the McKinnon warehouse took fire through its windows from the Globe office across the way. A building is not fire-resisting unless its windows are protected. With protected windows any brick building with fire walls and a reasonable roof would be hard for the fire to get at; without them a building may be as fireproof as a stove and burn as well. It is the stock that burns. Most stock burns well and much of it is very inflammable. There is nothing to prevent fire running through a fire proof building from front to rear, if there is nothing but glass between its stock and a fire across the road.

There is one other question of some interest:—How far is a portable fireproof safe a certainty in case of fire? There are rumours of safes being burst open by their fall from an upper floor. Whether this is founded upon evidence or conjecture there is certainly, in one statement of the Insurance Companies' Report, some food for conjecture as to the fate of safes which fall to the cellar. The report says:— "The hardware stocks were in very bad shape; hardened steel tools, gun and rifle barrels and heavy shelf hardware being found in masses, sometimes of several tons weight." How is a safe likely to fare that falls into the sort of fire that could make one mass of steel implements such as are described above! There should certainly be some hold in the wall for portable safes, to keep them out of the cellar. What answered once will not necessarily answer now; for with bigger buildings we have bigger fires.

THE ARCHITECTURAL ASSOCIATION AND ITS WORK.

SECOND ARTICLE.

In a previous article some account was given of the habitation of the Architectural Association and its Day School, which takes care of preparatory and junior work. This work is carried on further by an Evening School, necessarily held at that time because it is for working students.

The Evening School, like the Day School, is a serious affair with a comprehensive curriculum and paid lecturers of experience; and the hours of attendance for students, 6.30 to 9.30, for four nights a week, means serious application on their parts.

"The complete curriculum" (to quote the Association Brown Book) "is arranged in two divisions with some extra subjects and extends over four years. There are in each division two parallel but distinct courses, viz.: a course of Lectures and Classes, and a course in the Studio." This means that the theory of Design, Construction and Sanitation so far as it can be taught by word of mouth is thus taught in the course of Lectures and Classes, and the instruction so given is worked out on the drawing board by practical exercises in the Studio. These parallel "Courses" of Lectures and Studio work are again sub-divided into "Divisions," not for the further classification of subject but simply that the whole subject matter may be cut into four convenient lengths to occupy the evenings of four winters. There are thus two divisions of lectures and two divisions of Studio work, and they are usually taken alternately, so that Division I. of the Lectures is followed by Division I. of the Studio, which runs parallel with it; and Division II. of the Lectures by Division II. of the Studio.

What is accomplished is laid down in the curriculum as follows:—

Division I. Lectures and Classes. 1. Greek and Roman Architecture and Classic Ornament. 2. Elementary Principles of Building Construction. 3. English Architecture to A.D. 1500. 5. Outlines of Mediæval and Renaissance Architecture in Europe. 6. Elementary Physics as applicable to Building, Formulæ and Calculations, Stresses and Strains. 7. Plane and Solid Geometry.

Division I. Studio. 1. Freehand Drawing. 2. Descriptive Geometry. 3. Perspective. 4. Ornament: Drawing from the Cast. 5. Greek and Roman Architecture: The Orders, their optical corrections, characteristic forms, mouldings and ornament. 6. Mediæval Buildings and their Accessories. 7. Building Construction. 8. Elementary Architectural and Decorative Design.

Division II. Lectures and Classes. 1. Materials, their Nature and Application. 2. Construction. 3. Hygiene (Drainage and Water Supply). 4. Hygiene (Materials and Construction, Ventilation, Lighting, and Heating.) 5. Professional Practice, including the London Building Act, Valuations, Dilapidations, Light and Air, Specifications, Approximate Estimation of Cost, Contracts and Agreements. 6. Lectures and Field Demonstrations on Land Surveying and Levelling.

Division II. Studio. 1. Stereography and Sciagraphy. 2. Architectural Perspective. 3. Ornament and Shaded Drawing from the Cast. 4. Studies in Ancient, Mediæval and Renaissance Architecture and Design, founded upon examples in these styles. 5. Designs and Working Drawings of Modern Buildings. 6. Internal Decorative Work. 7. Time Sketches.

The Extra Subjects are:—1. Lectures and Classes on the Elements of Quantity Surveying, including the Preparations of Estimates. 2. Instruction in Modelling. 3. Elementary and 4 Advanced Water Colour class. 5. Ornament and Colour Decoration. 6. Class for Sketching and Measuring. 7. Lectures and Demonstrations on Perspective. 8. Discussion Section.

The latter comes under the head of extra subjects chiefly in virtue of its special fee of half a crown. It is simply a paper reading meeting, held on the fifth night of the week, but it is made safely instructive by securing the presence of a person of special experience in each subject under discussion, to sum up the debate.

This it is not too much to ask a busy man to do occasionally, but with the exception of this, which strikes few places far between, there is no volunteer work connected with the evening school. There is also a School of Design and Handicraft which resembles what in America is usually called a Sketch Club, except that to the School of Design and Handicraft it is intended to add a course of workshop demonstration. This school has, for each of its two divisions, a monthly meeting presided over by an architect drawn from a large Committee of Visitors. This also is volunteer work; but with the exception of this and the chairmanship of the Discussion Section there is no volunteer work asked for in the teaching work of the Association. In fact one might almost say there is no volunteer work asked for at all, for, though the president and other honorary officers must no doubt give their minds to the affairs of the Association during their term of office, they are not called upon to do any clerical work. For this there are salaried officers.

This is the central fact to be extracted from an inspection of the doings of the Association; nothing is expected for nothing and nothing is given for nothing. It is recognized that no one can afford to give time and labor such as is required for real teaching, unless he can get or help to get his living thereby. This is the fundamental basis of the schools; they offer something worth having. The right to ask for the fees which carry the work along and the readiness to give them are consequences. It should, however, be noted that the kind of immediate inducement, which young people and even their parents require to seduce them to a proper valuation of the necessity of high training, is present in the examinations of the R.I.B.A The letters signifying associateship and fellowship of the Institute are becoming more important to architects than ever, as the demands made upon the architect's capabilities become more complex, which is only to say that it is the need of education that is recognized by young architects rather than the necessity of letters. The Institute's examinations have come to take exactly the place they ought to take—a place which our examinations ought to take—a convenient standard for testing efficiency; a definite landmark to aim at in an outlook which extends to such hazy distances that it is satisfactory to have something obtainable in view, which, when reached, is a guarantee that one is in the right way and is getting on fast enough. This is the advantage that the Institute is to the Association. The Association, however, does not live by reason of this,

but because its work is good; and it is good because it is paid for. The condition precedent to paying teachers must be receiving fees, but more certain than this is it that the condition precedent to receiving fees for teaching is offering the sort of teacher that can only be got by payment. There are virtuous circles as well as vicious circles, and this is one. However, the Association circle was started in its round, it is working all right now; in both the day school and the evening school the fees received from students more than pay the salaries of the instructors—in the day school by nearly as much again.

The same quid pro quo principle holds in other doings of the Association. They publish a Sketch Book which has grown to be a valuable production—one that our architectural associations would do well to subscribe for. The first thing that occurs to one who knows the difficulty of keeping up anything that depends upon voluntary work is "how is the supply of 72 plates a year kept up?" The answer is simple—they are paid for. The subscription for the sketch book is a guinea a year, but four drawings, i.e., one for each quarterly part, entitles the contributor to receive the Sketch Book for a year and ten extra copies of each of his drawings. This is a good bargain for all concerned. Every advanced student or young architect makes some measured drawings during the year, either in his own country, which is full of invitation, or in the little holiday on the continent which is now so common. The obvious thing to do is to make the drawings 17¼ x 13½ inches to suit the Sketch Book and take some pains about them that they may be accepted. It means a guinea in pocket for doing what one was going to do anyway, and ten copies of one's work instead of one. To the Sketch Book it means a competition of drawings, instead of labour to get them; to the subscribers generally, the same competition must give better and better drawings every year; and the virtuous circle is completed by the impulse given to holiday studying by this reward for its immediate results.

One might go further in investigating the proceedings of the Association and still find this method of reciprocal benefit: the travelling student, for example, is anything but free in using his scholarship. He must submit his route for approval; he must send back a journal; he must give up his drawings for exhibition, and the Association have the choice of one to keep. The Association thus get something out of their gift, but the benefit is still the greater to the student who makes better use of his scholarship under these conditions than he otherwise would.

It is evident that the first consideration in providing for the instruction of students is to provide a good thing; it is only thus it will obtain support. It may be necessary to begin with money in starting the circle, as the good thing must be presented to students in order to get support, and the cost of presentation is the first step in establishing the circle of advantage. But for this, if for anything, it is fair to ask for aid from the public or the rich. Indeed, a loan might be all that is necessary, for, if similar methods bring similar results, the financial statement of the Architecturnl Association shows a profit on teaching that would make it easy to pay back soon a sufficient initiative loan.

It may be the better for definiteness to have the Association figures before our eyes; without supposing that either fees or salaries must necessarily be the same over here. The fees for the four regular divisions of classes and studio come to about $26.63 a year, and the Sketch Club 65 cents a year additional. The extra subjects spread over the four years come to about $6.42 a year. That is to say the cost to the student, who takes every opportunity offered, averages $33.70 a year and amounts to $134.80 for the four years. The cost to the Association in 1903-4 was $2,401.42, in lecturers' fees for the evening school and the students' fees received exceeded this amount by $590.

W. A. Langton.

THE TORONTO BUILDING STRIKE.

After more than a month of idleness the striking builders' laborers in Toronto have gone back to work at the same rate of wages as they were receiving prior to the strike. The bricklayers who supported the strikers have also resumed work. The net result to the strikers is the loss of thousands of dollars in wages which might profitably have been spent in providing fuel and other necessary supplies for the approaching winter. Owners of new buildings under construction have been put to great inconvenience, and the general trade of the city injured.

The strike was entirely unwarranted, in fact was nothing short of a "hold up," and was generally so regarded. Public sympathy was unmistakably against the strikers, and some of the daily papers found courage enough to denounce in plain language the action of the unions. The absurdity of the demand made by the laborers' union for a wage of 28 cents an hour is shown by the fact that the rate paid in Winnipeg, where labor is scarce and cost of living nearly double what it is in Toronto, is only 22½ cents. Furthermore, it would manifestly be unjust to pay such a wage to unskilled labor while paying only 30 cents an hour to skilled carpenters who, in addition to the years spent in acquiring the technique of their trade, must lay out a considerable sum in the purchase ofexpensive tools.

The bricklayers were under no obligation to stand by the striking laborers and thereby violate their agreement with the Builders' Exchange. On the contrary, they should have shown their disapproval of what they knew to be an unjust demand. Had they done so, the strike would have collapsed at a much earlier date and they would have been money in pocket. To show how little their support was appreciated it need only be stated that while they were walking the streets many of the striking laborers were working at 20 cents per per hour as helpers to concrete and other contractors.

As a means of avoiding these untimely interruptions to trade the Builders' Exchange should insist that in future agreements to govern wages must date from the first of January.

H. C. Standage writes to the Decorators' and Painters' Magazine that one of the easiest methods of cleaning a sponge that has become fouled by wiping the surface of paint or varnish, is to dissolve 1 oz. of permanganate of potash in 5 parts of water, and steeping the sponge in the fluid for fifteen minutes. Then squeeze out the fluid and allow to dry. When dry, put the sponge into a solution prepared by dissolving ½ lb. of hyposulphite of soda and 1 oz. of oxalic acid in 1 gallon of water. Allow the sponge to soak in this bleaching fluid for 15 to 20 minutes; then take out and rinse well in cold water, and hang up on a line until dry.

NORTHWEST NOTES

Branch Office of The Canadian Architect and Builder,
310 McIntyre Block, Winnipeg, September 12, 1904.

WINNIPEG BUILDERS' EXCHANGE.

The Exchange held its fifth monthly meeting on the evening of the 6th inst. and had a record turnout. The meeting proved a very interesting one and considerable business was transacted.

New members continue to be brought in, nine names being added to the list at this meeting.

A number of enquiries were received from outside points regarding business here. One from Toronto touching on the question of laborers' wages was discussed.

One important motion passed was to the effect that no member of the Exchange should sign any form of contract other than that approved by the Exchange—"The Uniform Contract." Any member violating this resolution will be subject to the penalty imposed in the by-laws, providing among other things for expulsion from membership.

Another motion passed was to the effect that no member of the Exchange should figure on any contract where another member had work in the same line unfinished without the consent of the first contractor.

An interesting paper was read on "Sentiment in Building" by Mr. E. S. Estlin.

Altogether the meeting was very satisfactory and showed that the Exchange is rapidly getting into shape and doing good work.

BUILDING OPERATIONS.

That the building trade is still very brisk is evident by the large number of buildings permits issued during August, viz., 181. There are still a large number of houses to be built before the season closes. The total amount of building so far this year has reached about 7½ million dollars; being by far the heaviest season Winnipeg ever had.

Yet with all the increase there has been in houses there seems to be as great a scarcity as ever of houses for rent, and rents remain much higher than they were last year. This speaks well for the increase in the population of the city. One needs to take a drive over the city to realize the vast amount of building that has been done this year. In all parts—north, south, east and west—houses have gone up and new streets have been opened. In Fort Rouge, the favorite residential part of the city, this improvement is especially noticeable.

Numerous wholesale merchants who have been increasing their accommodation are getting their buildings near completion, although no doubt it will be the end of the year before the finishing work is all done. There is hardly a wholesale building in the city that has not had two or three stories added to it—a proof that the original builders anticipated a great growth in the wholesale trade of Winnipeg and prepared the foundations in the first place so that additions could safely be added to their buildings.

A very interesting and busy scene is the work on the new subway on Main street at the C.P.R. station. Work here is progressing very rapidly. The cement and concrete walls and piers are almost finished, and a large number of supports for the concrete arches have been placed. The excavating of the roadway is finished and the electric street railway tracks have been run as far down as possible so that the through car service with the north end of the city may be quickly established. The C.P.R. track has to be raised yet as it is not at its full height, but that will be done quickly when the time comes.

The contractors found that the excavating took more time than such work usually takes as the steam shovels usually used for this class of work could not be employed in the tough clay here which had therefore to be dug out by hand which makes it a much slower and more expensive process.

Eastern contractors putting in tenders for work in the west would do well to bear in mind the great difference there is in the soil in the west, the tough clay taking much more time to excavate. Other peculiar differences exist which add to the expense of working.

A RECORD FLAG POLE.

A flag pole designed to be placed on the top of the new Union Bank building is the longest ever brought into Winnipeg. It was imported from Washington Territory by the Sprague Lumber Company. It is 86 feet 11 inches long, and tapers from 12 × 12 inches at the butt to 7 × 7 inches at the point.

PERSONAL.

Mr. Herbert H. New is the latest addition to the list of architects in Winnipeg, where he has established an office in Molsons Bank building. Mr. New has recently arrived from Boston where he was engaged with the well known firm of C. & H. Blackall. He is much impressed with the prospects of Winnipeg.

Mr. H. B. Rugb, who had just taken an office at 367 Main street, Winnipeg, as our last last issue went to press, is now settled and has already submitted some attractive drawings, and is on the eve of starting his first commission.

BRICK MAKING AT BRANDON.

The Brandon Brick and Lumber Company, Ltd., which was incorporated several months ago with a capital of $100,000, is on the eve of completing the installmeot of their plant, and expect to be in full operation very shortly. This company have purchased the right of the "Huennekes System" for Western Canada. The product will be a dry pressed brick of sand and lime, baked in a chemical steam cylinder, the special advantage claimed being the production of a brick of a stone like character at a moderate cost.

The sand is first passed through a drying machine, the heat for which is supplied by the exhaust steam from the boiler. It is then carried by a band conveyor into a tubular grinder at the entrance of which is a unique apparatus which acts as a measuring or weighing machine and at this point the correct quantity of lime is admitted, to mix with the sand passing into the grinder. From this machine the two materials are conveyed into a mixing machine where a sufficient quantity of water is added to slack the lime. From thence the material is elevated to a storage receptacle immediately over the brick press of sufficient capacity to hold one day's working, the mixing of one day being held over until the following.

The "Press" has 3 moulds and has a working capacity of 15,000 bricks in a day of 10 hours.

After passing through the "Press" the dry brick is wheeled on trucks into the immense cylinder, which measures 62 feet in length by 6 feet diameter, provided with a steaming apparatus, with small perforations the whole length of the cylinder; into this cylinder the bricks are placed and the steam is applied at a pressure of 100 to 125 lbs.; thus, steam bakes the brick; there is a small "reservoir" at a certain point in the steam fittings, into which is placed a chemical mixture which has the effect of adding to the steam as it passes through the properties which give to the brick its special hardness. The company is expecting to do a very large business, as they have a large supply of sand available in the district, at a minimum cost of production.

The directors of the company are:—Dr. McDiarmed, Mr. H. Sampson, Mr. J. Clark, Mr. H. A. Rose, Mr. A. R. McDiarned.

MANITOBA'S STONE SUPPLY.

The present season will probably close as the "record" season in Winnipeg's building, but as pointed out in previous issues, many more buildings would have been completed, had there been available a more plentiful supply of material.

Undoubtedly one of the main causes of this lack lies in the fact that supplies have to be drawn from outside, and in many cases from far distant points. It was therefore welcome news that there was evidence of an unusual quantity of good material in the shape of lime stone within easy reach of the city. It was to demonstrate this that the Garson Quarry Company, Limited, chartered a special train on Saturday, August 27th, and sent out invitations to all interested in the building trades, to visit their Tyndall quarries, an invitation which resulted in a goodly array of prominent Winnipeg building men sallying forth prospecting.

The quarries were reached after a smart run about three in the afternoon.

There are three separate quarries at work, one in operation by the Garson Quarry Co., and two by the Gunn Quarry Co. The first to be examined was that of the Garson Company. Excavations have been made to a depth of 55 feet and reveals me very useful stone for all ordinary purposes. It is interesting to note that the contractors for the C.P.R. Hotel at Winnipeg have made arrangements to draw the whole of their supply from this quarry. The quarry works cover a space of some 2½ acres. The company have rights extending over 200 acres and tests thus far made are said to have proved 70 acres to be good building stone.

Great interest was evinced in the various details of working, the steam drill coming in for no small amount of attention, work-

ing as it did with the greatest ease, making a 2" hole 8 ft. deep in the solid rock; dump drills, hand drills, and all the methods were here seen in operation. On one side of the quarry was fitted up a complete manufacturing plant, a machine for cutting, a turning machine, and a large staff of stone cutters were at work preparing stone for buildings now in progress. There was also a row of some 8 lime kilns, with a total capacity of 2,000 bushels per day.

Turning to the adjoining quarries, about ½ mile distant, conclusive evidence appeared of the general "stone" character of the district. Although in these, development had not progressed so rapidly, still the stone brought to light was equal in every respect to that previously considered. The method of chiseling here was somewhat different to that in the other quarries, a large steam chisel being in operation, working at a pressure of 80 lbs. and capable of chiseling 100 ft. per day of 10 hours.

After a very pleasant and instructive afternoon, the company were entertained at an excellently spread table, provided by the

"Garson Quarry Co." Conversation naturally turned upon subjects of interest to building men, ending with a few informal speeches and votes of thanks.

There is little doubt but that the result of the afternoon's trip will be an increased interest in the use of local stone for Winnipeg's future buildings, and should the transportation question prove as satisfactory as the supply is adequate, a large and profitable business is in sight.

The present quarries have only been in operation 5 years and at the present rate of development they are expected to last well into the century.

PLASTIC DECORATION.*

By John D. Crace, Hon. Associate R.I.B.A.

The lecture was very fully illustrated by plaster models and casts lent by Messrs. George Jackson & Sons and by the South Kensington Museum authorities, by a series of large mounted photographs lent by Mr. B. T. Batsford, and by numerous lantern slides, of which five and twenty had been placed at the lecturer's disposal by the A. A., Camera Club. Having alluded to the prehistoric use of cement and plaster as a uniting substance and a protective surface material, the author gave reasons for his inference that stucco was used decoratively in an early period of Greek history. Among the many wonderful revelations of Mr. Arthur Evens's explorations in Crete are the stucco decorations in relief of the walls of the Palace of Knossos which was destroyed before 1500 B.C. Beautiful specimens of decorative stucco-work have been unearthed in excavating the ancient sites of Rome and the surrounding country. The author referred to those at the baths of Titus discovered in the sixteenth century, to those at Herculaneum and Pompeii, and to the decoration of two sepulchral chambers discovered on the Via Latina, dating about A.D. 160. In the Farnesina grounds remains of buildings have been unearthed with stucco reliefs unsurpassable for elegance and refinement of execution. One great value of these works is the lesson they teach us in the adjustment of the actual treatment in execution to the nature of the material. The whole surface speaks aloud of the ready and dexterous use of fingers and tools on a light plastic material. One almost imagines the stucco yet moist, still impressible to the touch. It is as if some fairy goddess had found it soft and lightly fingered it. There is a sense of evanescence about it, whilst the charm of perfect attainment remains.

The author then turned to a beautiful but very different growth of plaster decoration developed under the Mohammedan conquerors, describing the decorations of the great ninth century Mosque of Ibu Tooloon at Cairo. In the Arabic art of Egypt plaster continued to be used as an important factor in decoration during the next five centuries. The ornamentation of the domes and the use of a fine stucco in low-relief ornament, as a preparation for gilding and colour on the wooden beams of its flat roofs, are especially noteworthy. The palace of the Alhambra is the very apotheosis of plaster—of plaster casting carried perhaps to excess of richness and elaboration, but never losing its true quality of ornament designed purposely for casting. The beautiful effects of a mere repeat casting, the author thought, were attained because (1) the designers thoroughly understood grace of line and how to fill their spaces; (2) they never lost sight of the fact that the work was to be cast; (3) most important of all all, the repetition did not include the representation of natural objects, for it is where representations of nature are concerned that repetition is offensive.

In European art during Mediæval times we get little glimpse of the decorative use of stucco until the 15th century. An original and striking example is to be seen in the drum of the dome of San Eustorgio at Milan, the work of Michelozzo Michelozzi, of Florence, said to have been executed in 1462. In the second half of the 15th century Bernardino Pinturicchio was making considerable use of the low-relief enrichments,

*Abstracted from a recent lecture before the Royal Institute of British Architects.

not only for the mouldings with which he divided the surfaces he had to decorate, but as ornamental features within the paintings themselves. A few years after Bramante was at work on St. Peter's. His investigations, says Vasari, resulted in the discovery of the method of preparing stucco employed by the ancients, the secret of which had been lost in their ruin, and remained concealed ever since. Vasari relates how Raffaelle and Giovanni da Udine went together to see some subterranean chambers then just discovered in excavating the Baths of Titus. Giovanni was so much impressed by the stucco decorations with which they were covered that he devoted himself to their study, and reproduced them with so much grace and facility that there was only now wanting to him the knowledge how to compound the stucco. At length, by compounding finely-powdered white marble with the lime from white travertine, he succeeded in producing the stucco of the ancients. Raffaelle at once caused Giovanni to decorate all the vaultings of the Papal Loggie in stucco. Pierino del Vaga, another of that wonderful band of young artists in the Vatican, stands pre-eminent as an ornamentist and as a decorative colourist; his stucco-work has a quality of fine decorative appropriateness, both in design and scale, that has been surpassed by none. Of his bolder conceptions the great ceiling of the Sala Regia is a fine example. Alessandro Vittoria was one of the best-known stucco-workers in the latter half of the sixteenth century. His work under Sansovino at Venice, in the Libreria, and in the Scala d'Oro of the Ducal Palace are characteristic examples of his style.

Francis I. attracted to France some of the most capable of the Italian artists skilled in stucco. Primaticcio and Il Rosso came about 1530, and their wonderful stucco decorations at Fontainebleau long influenced French design and French sculpture. Niccolo dell' Abbate followed twenty years later, and then his three sons, the youngest becoming after a time the director or manager of these decorative works. Their work is a fine field for the study of what may be done in stucco, and it was the parent of the rich decorations of Louis XIV.'s reign, which, in their turn, became the model for civilised Europe.

Henry VIII, was also very successful in securing the services of able artists in England, many of them pupils or relations of those who were at work on the masterpieces of the Vatican. Pietro Torrigiano, who was among the earliest, completed the bronze monument of Henry VII, in 1519. It was to the Palace of Nonsuch that the new stream of talent was directed; although not a vestige of it now remains, the names of some of the men who adorned it are a guarantee that the work was neither coarse nor commonplace. As to the question lately raised about the external panels of Nonsuch being in stucco, the author said there was not the smallest doubt on the subject. There were plenty of examples done more roughly within the next seventy or eight years which remain to this day, in spite of exposure and neglect.

External decorative work in plaster continued to be a feature of many English houses down to the end of the 17th century. But the interior was the more important field, and from the time of Nonsuch for a century no house of any pretence was without its elaborate plaster ceiling and frieze. Admirable in many ways as these old English ceilings are, few of the men who did them had either the art or the skill of the Italians, who made ornamental plaster work popular. The latter endeavoured to make their work perfect in modelling and finish. Each figure was a work of art. In the English plasterwork, however, scarcely a figure can be found that is not more or less barbaric in execution, and the minor work, effective as it is, is often greatly wanting in grace of line and in intelligent modelling.

The next step in English plaster-work leads straight to the Classic work of Jones and Wren. The gap caused by the Civil War made the change more complete. Building operations after the Great Fire opened the way to new men and methods. French and Italian plaster-workers were again invited to England in Charles II's reign. Besides the work in St. Paul's, St. Stephen's, Walbrook, and other city churches, the chapel of Trinity College, Oxford, may be cited as a good typical specimen of plaster ornamentation. A feature of some of the plaster decoration of the end of the seventeenth century is the elaborate modelling of fruit, flowers, and foliage in full relief, often in parts quite detached from the grounds and either supported by wires imbedded in the plaster or by small sticks of tough wood. This work, full as it is of artistitic ingenuity and clever modelling, was by that very ingenuity departing from any true principles of stucco-work, and therefore hastening the decay of the art: A notable example is the ceiling of the chapel of the Royal Hospital, Kilmainham. The next modification of style was largely due to Kent. In his designs the plaster ornamentation is mainly used as architectural enrichment, bold in treatment—sometimes too bold for the space, but effective in its way. Following closely on Kent's work came a flood of plaster ornament derived from the French work of the time of Louis XV. This was sometimes very good—often straggling and purposeless, yet not without a certain elegance. The best of it was at least partly modelled, but the greater part was cast and fixed. With this style stucco modelling practically came to an end. All that followed was cast and fixed. The change of style brought about by the brothers Adam was due to the same influence which has produced the detail of the Vatican Loggie and the Villa Madama—namely, that of the antique stucchi in the excavated ruins in Rome. The difference in the result may be thus accounted for. Giovanni da Udine studied them, as an artist by endeavouring to produce similar work with his own hands. Robert Adam, as a draughtsman, copied them on paper, as did probably the Frenchmen through whom France adopted the style. It was undoubtedly elegant, and the effect refined; and, since the method of reproduction was mechanical, it lent itself to extensive use.

Much good plaster work has been done in the last half of the 19th century—always in the form of attempts, sometimes very successful, to reproduce a past style, and by casting. "Fibrous plaster," introduced since 1861, is a valuable innovation, and presents immense advantages. It does away with the danger of enormous overhead weight, and requires so much the less timber structure to carry it; it can be executed quickly, and it dries quickly. The facility of plaster work is at once its recommendation and its danger.

It is, perhaps, well to be sometimes reminded that the simplest materials have not been scorned by the greatest men, and that the finished result of any art pleases not only by the talent bestowed on it, but by the fitness of the limitations which the artist has imposed on himself.

Mr. R. Phene Spiers, F.S.A., proposed a vote of thanks to Mr. Crace, and expressed his concurrence in the lecturer's condemnation of the imitation in modern plaster work of the wavy surfaces and crooked lines found in old examples, and due in them to indifferent technical skill. He held that all plaster decoration should be executed on curved surfaces, as not only was a perfectly flat surface less pleasing to the eye, but it gave the appearance of sagging.

Mr. G. H. Fellowes Prynne, in seconding the motion, remarked that stucco was not satisfactory or permanent as external work in this damp and variable climate. Plaster decoration should only be employed under cover, and then in low reliefs on plane surfaces. For such mural decoration in low relief there was now a very large opening.

Mr. W. Aumonier observed that the harmonious effect of 16th-century plaster was due to the fact that both the moulding and the modelling were entirely handwork, whereas in most of the present day decoration all the mouldings and outlines were rigidly and mechanically produced, and even much of the modelling was executed in facsimile.

In replying to the vote of thanks, which was carried bo acclamation, Mr. Crace said he agreed with Mr. Spiers that very low relief decoration appeared to greatest effect on a curved suface; but for all that the artistic merit of a subject did not depend upon the angle at which it was seen.

DESIGN.

A conference dealing with arts and crafts was held in connection with the Bradford Exhibition a few weeks ago, when Mr. Walter Crane, the well-know artist-craftsman, gave a lecture on "Design."

Mr. Crane first showed the linear resources in abstract which were at the command of the designer, and went on to demonstrate some of the rules which were observed in different classes of designing. Coming to speak of the importance attached to beautiful things, he observed that, as a domestic nation, fond of their homes, and exercising constant and often highly-cultured taste in respect of their decoration, considering carefully the colours which they cared to live with, the patterns with which they would have to put up day in, day out, the form of the furniture, and all these things, Englishmen had been forced to consider whether they should not make the things of their homes beautiful as well as reasonably useful. A sort of national shyness, or shirking from display had laid a rather wholesome check on exuberance in ornament.

Turning to speak of the style which is known as the "New Art," Mr. Crane observed that that style had had a very sudden rise, but its origin was quite traceable. If there was a public analyst for art, he would rather like to catch some of the most extravagant specimens of the "New Art," and send them to the analyst in a bottle for examination. The sources of the details could quickly be determined. The whole style might be described as a species of rhetoric in design—a rhetoric which was rather meaningless, and which was much repeated, sometimes in skilful hands but very often in unskilled. It had had, however, great influence over the decorative art of our time, both at home and on the Continent. It could not be denied that it had about it certain dramatic power. But one could not live too far from Nature for long without suffering in health, and the forms reminded him of plants which, under artificial stimulus, had been drawn up into very long stalks, with flowers only on the extreme end. Although it was "New Art," it seemed to him already in decline. It had exhausted its own stock of expressions.

Mr. Crane urged students to study Nature, observing that they need not be inappropriately naturalistic but the more they studied natural forms the more varied and interesting would be their design. A new fashion had now come in, a kind of secondhand Louis XVI., with early Victorian mixed. This pretended to go to Nature, but a real rose would blush to find itself by one of the rose garlands of the newest art. Mr. Crane proceeded to speak of the modern movement toward beauty in craftsmanship, and pointed out that a necessary constituent in the beauty of an object was that in its design there should be full recognition of the characteristics and limitations of the material which was used in its production.

There was, he observed, in all manufactures a tendency to imitate, and to exert skill in trying to step beyond the nature of the material, which found acceptance at the hands of those who, if they could not have costly things, would rather have a cheap imitation than nothing, or than something which was simple. Under the industrial organisation of the last century the ideal had been mechanical precision—quantity rather than quality. A different idea was asserting itself more and more.

Where England was behind was not in the capacity for producing beautiful and individual objects, but in the realisation of the national importance of art—art as the expression of the life of the community. England did not give sufficient opportunities to her sculptors to do great things. Instead of perpetuating the form of an eminent citizen in senatorial garb—frock coat and so on—his portrait might, he ventured to suggest, be confined to a bust or to a medallion, and the artist might be called upon to exert his skill in a heroic group or composition typifying the life's work of the citizen who was honoured. England had a great deal to learn in that respect from her neighbours of France and Germany.

In conclusion, Mr. Crane commended the drawing which he had that day seen at one of the Bradford schools, and emphasised the importance of the teaching of drawing well. Education, he pointed out, did not consist in learning various facts, and he feared that in schools not enough play was left to the imagination. English people were over-industrious, and were afraid of the pleasures of the imagination.

A SUBSCRIBER writes: "I have to fix a brass curb on a marble curb around a dining-room grate. The brass has already been fixed once or twice in cement, but this has been broken and the curb has come out of its place. Which would be the best way to fix it?" The best plan would be to rivet iron bars on to the standards, pass them through the marble curb and bolt to the underside of the hearth.—Builders' Journal.

THE McCLARY MANUFACTURING COMPANY'S NEW WORKS AT LONDON, ONT.

These new works, situated on the north bank of the Thames river, at the corner of Adelaide and Trafalgar streets, and devoted exclusively to the manufacture of stoves and furnaces, contain many features in the way of special arrangement and equipment, a description of which it was thought would prove interesting and instructive to architects and engineers. The buildings consist of a moulding shop, a stove mounting shop, a storage warehouse and an independent power house.

The new works have been laid out with the object of simplifying and expediting as much as possible the sequence of processes of the manufacture of stoves and furnaces, and the equipment has been arranged in such a way that the material in process of manufacture is received at one end and shipped from the other end of the works, thus avoiding the necessity of any piece in process of manufacture being carried back to any point it has once passed.

One of the most important elements of the thoroughness and efficiency of the plant is contributed by the electrical equipment, the various machines in the works being arranged in groups, similar machines being in one group driven by a single line shaft driven by an individual motor attached to the ceiling or placed in such position above the floor as to be entirely out of the way. The result of this distribution of power is that the line shafts have been placed in the most advantageous positions to give ample room, light, and convenience. The difficulty so frequently met with in industrial establishments, namely, the laying out of the line shafting and the counter shafting in such a way that all will form a unit driven by one or two engines, has been entirely dispensed with, with the result that the company have one of the cleanest, best lighted, best ventilated and most efficient industrial plants to be found anywhere.

FIG. 1.—VIEW OF POWER HOUSE, SHOWING RAILWAY SIDING FOR COAL DELIVERY.

The buildings were designed by and erected under the supervision of Messrs. Moore & Henry, architects, London, Ont., and the power plant and electrical distribution system and equipment were designed by and installed under the supervision of Mr. Roderick J. Parke, consulting electrical engineer, of Toronto.

The moulding shop or foundry, in which the first process of stove construction takes place, is situated at the north-west corner of the property, and is 200 feet wide by 220 feet long, one storey high, built of white brick with concrete foundations and having a roof of the saw-tooth variety, as shown in Fig. 2, the glass sides of the roof being exposed to the north, giving all the light desired without exposing the workmen to the direct rays of the sun. The moulding shop has a concrete floor; across the south end and divided from the moulding room is the milling room containing the tumblers and core ovens. A Colliau cupola having a melting capacity of 10 to 12 tons of iron per hour is located in the centre of the moulding shop, as shown in Fig. 4. The charging platform is constructed of steel and concrete to support a track from the cupola to the north wall of the building at which the pig iron and coke are received from the railroad cars which are taken in on a siding especially constructed for the purpose, the moulding shop being located in such position as to take advantage of a hill at the north side, thus enabling the railway cars to be shunted up to the level of the charging platform. The progress of the material and product through the moulding shop is direct and continuous, toward the mounting shop.

The mounting shop, located about 200 feet east of the foundry, is 307 feet long by 32 feet wide, two storeys in height; the walls are built of solid concrete, and the floors of steel and concrete, being of absolutely fire-proof construction. Between the foundry and the stove mounting shop is the pattern storage warehouse, 130 feet long by 40 feet wide, one storey high.

All of the motors in the mounting shop are supported on or near to the ceiling so as to occupy as little useful room as possible. Each motor is controlled by a Cutler-Hammer motor starter with automatic no-voltage release. Push buttons are installed at various points so that a motor can be instantly stopped in the event of an accident occurring or a quick shut-down becoming necessary.

Direct current is distributed throughout the buildings to the various motors and lamps, at 230 volts. The works are illuminated by means of Adams-Bagnall 3.5 ampere 230 volt arc lamps, and 230 volt incandescent lamps. Separate circuits are provided between the power house and the shops so that separ-

ate control is had at the switchboard for the lamps and motors in the moulding shop and the mounting shop. Sub-distribution panels are located in the shops for the separate local control of incandescent and arc lamp circuits and certain of the motor circuits, thus

FIG. 2.—EXTERIOR VIEW OF FOUNDRY, SHOWING "SAW-TOOTH" ROOF CONSTRUCTION.

affording a very flexible system with a minimum amount of wiring and maximum simplicity.

The power house is located on the north bank of the River Thames 300 feet south of the mounting shop. It is built of white brick one storey high with concrete foundations and concrete floors, and is 104 feet long by 35 feet wide, with a wing 56 feet long by 44 feet wide for the storage of coal, this wing being in such position as to take advantage of the natural gradient, permitting the railroad cars to be shunted to the north end of the coal house so that the coal can be dumped directly from the cars into the coal bunkers.

The boiler equipment consists of three 100 h. p. standard internal fired Scotch boilers, manufactured by Messrs. E. Leonard & Sons, London, Ont., and constructed for 160 lbs. working steam pressure. They are 15 feet 9 inches in length over all, exclusive of the smoke box. The shell of each boiler is 84 inches in-

FIG. 3.—INTERIOR VIEW OF FOUNDRY, SHOWING CUPOLA AND CHARGING PLATFORM.

side diameter, made of 19/32 inch steel plate. There are 56 tubes 3½ inches outside diameter and 12 feet 6 inches long. Each boiler is equipped with a Morrison suspension type corrugated steel furnace, 40 inches inside diameter by 12 feet 2¾ inches long and 7/16 inches thick, and a Jones underfeed mechanical automatically operated stoker, which with the induced draft equipment affords an available capacity of 150 h.p. from each boiler when required. When the fourth boiler, for which space is provided, is installed, the total plant capacity will be 600 h.p.

A Green fuel economizer has been installed to operate as a part of the steam plant. This economizer contains 1920 square feet of heating surface and is divided into 40 sections, each section containing four tubes 4 9/16 inches external diameter and 9 feet long. The economizer is provided with a safety valve 2¼ inches diameter and a blow-off valve 3 inches in diameter, and the front or face of the machine consists of 10 sectional removable covers 2 feet 5 inches wide with 2 inches of asbestos lining. Each section of the economizer was subjected to a hydrostatic test of 350 lbs. to the square inch before erection, and after the economizer was erected it was subjected to a hydrostatic test of 200 lbs. per square inch.

The advantage of the economizer is apparent, in view of the fact that when the plant is operating at full load the temperature of the feed water is raised from 112 degrees Fah., at which temperature it is received from the exhaust heaters, to 260 degrees Fah., at which temperature it is delivered to the boilers.

FIG. 4.—EXTERIOR VIEW OF STOVE MOUNTING SHOP, SHOWING CONCRETE CONSTRUCTION.

The reader will notice on looking at the illustration the absence of a tall stack or chimney. Draught for the boiler furnaces is obtained by means of forced and induced draught combined, the forced draught being supplied from a 30 inch three-quarter housing bottom horizontal discharge Buffalo Forge Company steel plate fan delivering air at 2 ounces pressure into an underground pipe leading to the underfeed stokers. This fan is driven by a 6 in. x 6 in. horizontal high speed engine supplied by the Robb Engineering Company, Amherst, N.S.

The induced draft is created by a duplicate fan apparatus furnished by the Buffalo Forge Company; the equipment consists of two 8 foot full housing-up blast steel plate steam exhausters, each being driven by a direct connected 4½ inch by 5 inch single vertical double acting engine having the cylinders below the shafts. The equipment is provided with water-cooled bearings, a sheet steel smoke chamber and a Y smoke outlet connection upon which the stack rests, the stack being 47 inches in diameter and 15 feet high, the top of the stack being about 40 feet above ground.

The smoke breeching connecting the boilers, fuel economizer, and induced draft apparatus, is provided

with by-passes and dampers arranged so that the economizer can be cut out of the smoke circuit at any time and the smoke turned directly from the boilers and through the induced draught fans to the stack. The induced draught fan engines and the stoker engine are controlled separately by two Foster automatic steam pressure regulating valves, so that when the steam

FIG. 5.—INTERIOR VIEW OF MOUNTING SHOP, SHOWING ERECTING DEPARTMENT AND "HOT BLAST" HEATING CONDUIT.

pressure falls below a given point more steam is admitted to the engines, and their speed is increased with a corresponding increase in the draught, with a reversal of this operation when the steam pressure goes above the pre-determined point for which the valves have been set.

The water used for condensing is drawn directly from the Thames River and is allowed to run to waste, as in view of the adoption of other methods of utilizing the waste heat the advantages of having a hot well are so small that its use is not warranted. Owing to the poor quality of the Thames River water for boiler feeding, the feed water supply is obtained from a creek across the river, this creek furnishing practically pure water. A special conduit was the city water mains to provide a reserve for use in the event of repairs being required for the regular feed-water supply system. The feed water is forced by the pumps, through the heaters, thence directly to the Green fuel economizer, thence into the boilers. By-passes are provided in the feed water line so that any heater and the economizer can be cut out of service when required. A feed water thermometer is provided at the outlet of each heater, also at the outlet of the economizer and on the main feed water line between the heaters and the economizer, thus enabling the attendant to determine instantly and accurately the value of the work each individual heater is doing, as well as the net results of the combined operation of the feed water heating system.

The engine exhaust is arranged as follows: The 75 h. p. engine and 50 k. w. dynamo unit is used only when a melting-heat is in progress and when required for lighting the works. The exhaust from this engine is connected directly to its condenser, but a branch and valves are provided so that the condenser can be cut out of service and the exhaust turned directly into the works heating system. An automatic relief valve to the atmosphere is provided between the engine and the condenser, this valve being adjustable to give any desired back-pressure within ample limits when the steam is being supplied to the factory heating system. The exhaust from the 185 h. p. tandem compound engine can be turned directly into its condenser, or directly into the factory heating system, or to the atmosphere, as may be required. A branch is provided to the 200 h. p. feed water heater, which latter can be run under a vacuum or at atmospheric pressure or cut in or out of service, as may be required.

The exhaust steam for the induced draught fan engine, the mechanical stoker engine, the condensers, and the boiler feed pumps, is run into a common exhaust pipe leading into the 80 h. p. heater, on the outlet of which is placed a vent pipe to the atmosphere, with an adjustable back-pressure valve on it. The exhaust steam from the auxiliaries is not condensed since it is utilized to better advantage in heating the feed water passing through the 80 h. p. heater. The temperature of the feed water from the small heater with the plant running under normal conditions averages 210 deg. Fah., and the temperature of the feed water passing through the 200 h. p. heater while the large engine is running condensing averages 110 deg. Fah. When the large engine is running non-condensing the temperature of the feed water averages 210 deg. Fah. It will be apparent from the above description that the auxiliary plant as designed affords full facilities for operating the power plant under the most economical conditions during the winter and summer season, in

FIG. 6.—VIEW OF PORTION OF BOILER ROOM, SHOWING 100 H.P. INTERNAL FURNACE BOILERS WITH UNDERFEED STOKERS AND PORTION OF STEAM PIPING.

addition to permitting advantage to be taken of the exhaust steam for heating the shops in winter, and of condensing in summer.

The switchboard equipment consists of two generator panels and a feeder panel, of blue Vermont marble, 65"x24"x2", with sub-panels 25½"x24"x2", each generator panel being equipped with an I-T-E "Dublarm" automatic double-pole 250-volt circuit breaker, con-

nected so that it is impossible to accidentally short-circuit either generator, the function of the circuit breakers being that the single poles of each breaker open and close independently of each other, so that in the event of a short circuit or overload remaining on the generator circuit after the breaker has been thrown open, the closing of the second pole will immediately open the other. These circuit breakers were made by the Cutter Electric Company, Philadelphia, and are adjustable for a capacity of 50 per cent. above and below the rated capacity of the respective generators which they are intended to protect. A double set of busbars with double throw switches has also been provided on the switchboard and the connections arranged so that the generators can be operated independently or in parallel. This provision has been made with the object of providing an independent control for lamps and for the 50 h.p. cupola blower motor in the foundry, as it is necessary to vary the speed of this motor at times, the variation of speed being secured by manipulation of the generator rheostat on the switchboard. When the cupola is in operation, the 50 k.w. unit and the 50 h.p. motor operate as an independent combination, a special pair of mains being run from the switchboard to the cupola for this purpose.

The circuits between the dynamos and the switchboard are run in trenches built into the floor, these trenches being covered with cast-iron checkered plates. The conductors are rubber-covered and are supported

FIG. 7.—INDUCED DRAFT FANS, SHOWING STOKER ENGINE BELOW PLATFORM, AND PORTION OF GREEN FUEL ECONOMIZER AT LEFT HAND.

upon split porcelain insulators held in position by iron clamps fastened by screws to 3″ × 3″ vertical wood strips set into the concrete flush with the walls of the trenches. The outgoing circuits from the power house are run underground through a brick tunnel. Forming a part of the switchboard is a gauge panel upon which are mounted a 10″ engine room clock, an 8″ boiler pressure steam gauge, an 8″ steam gauge connected to the receiver between the high and low pressure cylinders of the compound engine, and two 8″ compound vacuum and back pressure gauges, one connected to the exhaust pipe from each engine.

For furnishing compressed air for operating the pneumatic hoists and other pneumatic machinery used in the works, a class D-2 10″ × 16″ × 12″ Canadian Rand

FIG. 8.—AIR COMPRESSOR AND MOTOR.

Drill Company air compressor has been installed. This compressor is driven by belt from a 40 h.p. Westinghouse direct current motor. This compressor is designed as a compound machine, the high-pressure or 10″ × 12″ halt being installed at present, the foundations being so arranged that the low pressure or 16″ × 12″ half can be installed when required. The capacity of this compressor is 446 cubic feet of free air per minute at a speed of 120 revolutions per minute.

A RHAPSODY OF THE NEW ART.

O catfish maid with the taffy arms—
A loop and a curve and a daub of greeo—
Flaunting the flow of thy molten charms
On the side of a soup tureen.

Art thou a girl or a goop or a fish,
Or merely a tinted thought,
Like a chocolate caramel stuck to the dish
And into thy semblance wrought?

O, limpid lips' insipid peace—
A loop and a curve and a daub of green—
O, rapture covered with verdigris
And Art that is sight unseen!

A lily grows on a silver stem
That twists as a bedspring might,
In the ruby shade of a Turkish hem
It holds an electric light.

O, lines of beauty, O, lines of care!
O, art of the new, new fad!
Loop, loop the goop of the limbs and hair.
Till the drinkers of fudge go mad!

—Wallace Irwin in N. Y. Globe.

Cement production in the United States in 1903 amounted to 28,454,140 barrels, according to the U. S. Geological Survey. Of this amount 20,897,973 barrels were Portland cement, 7,030,271 barrels were natural cement and 525,896 barrels were slag cement. The amount made in 1903 was about 2,700,000 barrels more than the output in the preceding year.

The effect of maintaining a higher standard of purity of the air breathed could not better be illustrated than by the following statement of facts: By improved ventilation the death rate has been reduced in children's hospitals from 50 to 5 per cent., and in army hospitals from 23 to 6 per cent., while prison records show, in one case, a reduction from the yearly average of 80 to 8. In the army stables of the German Government better ventilation has reduced the death rate among the horses from 19 to 1.05. Such facts speak for themselves.

AN EXTRAORDINARY FEAT IN HOUSE MOVING.

The Engineering Record describes how the John Eichleay, Jr., Company, of Pittsburg, Pa., transplanted a brick residence to a new site 160 feet above the one on which it originally stood at the foot of a cliff, without in any way injuring the building. The face of the cliff behind the house was terraced by excavating in it six cuts making an equal number of horizontal platforms about 90 feet long and from 10 to 20 feet wide, affording level seats for the successive tiers of cribbing. The excavation was nearly all in solid rock, which was drilled and blasted with light charges of dynamite, thirty men being busy on it during the entire progress of the work.

Holes were cut through the end foundation walls and 12 x 12 inch longitudinal needle-beams about four feet apart were inserted in the usual manner. They were parallel to the face of the cliff and reached through from wall to wall of the main part and the wing. Main 12 x 16-inch sills were placed under them and carried, on each side of the front and rear walls, 12 x 12-inch longitudinal sills which supported the latter with pairs of short transverse 10-inch I-beam needles. The main sills were jacked up to lift the building clear of the foundations, which were then removed and the ground was leveled to receive lines of cribbing under each of the main sills. Each line of cribbing was located on the center of the sill and consisted of a continuous row of cribs made of 6 x 8-inch timbers about 3½ feet long. The bases of the separate groups were made horizontal, but at irregular heights, offset to correspond with the surface of the ground, and were leveled up so that the upper courses were in exactly the sale planes. There were in all eight lines of cribbing perpendicular to the face of the cliff, one under each main sill. Two lines of cribs supported each end wall of the main part of the house. Two more lines were spaced at equal distances between them and two carried the end and centre of the wing. About three hundred 5-ton jacks were set under the sills bearing on the second course from the top of the cribbing. These were divided into thirty groups of from eight to twelve each, from three to five groups being located under each sill. At a signal given by blowing a whistle, one man started at the end of each group and gave each jack in succession one-half turn. After all the groups had been turned, another signal was given and the men returned to the starting points, screwing each jack another half turn and so on back and forth, simultaneously screwing the jacks so as to raise the building uniformly about one-half inch at each round trip.

The building was thus raised about 14 inches in less than two hours. A new course of cribbing timber was then laid in the space between the last course and the sills, and the jacks were simultaneously slacked off sufficiently to lower the sills to bearing on it. The jacks were then screwed down, set one course higher, the building raised another fourteen inches and so on. As the building was raised the lines of cribbing were extended so as always to reach beyond it to the gradually receding face of the cliff where new cribs were started on successive footings leveled to receive them. In every eighth or tenth course longitudinal timbers 20 or 30 feet long were used to bind the cribs of each line together, and the next course above them usually contained several long transverse timbers reaching through, and built into, the next line of cribs to bind the two together and insure their lateral stability. The cribs were also braced by inclined shores and were X-braced by wire ropes reaching from the top to the bottom of each panel under the main part of the house. In each panel between cribs vertical planks were spiked to the longitudinal sills, and horizontal longitudinal beams were bolted to their lower ends to carry the suspended working platform of loose transverse planks. These were arranged at the proper height to be convenient for the workmen to build the cribbing and operate the jacks and rollers. They were always maintained in the same relative position as the building was raised, and when the floor planks approached the cross timbers, the latter were picked up and placed on top of them so that when the scaffold was raised a little higher, it engaged them and lifted them off. The main sills supported a stiff-leg derrick with a boom commanding the full length of the building and operated by a hoisting engine at the bottom of the cliff. This derrick delivered the crib timbers to the men who were always busy on the suspended platforms.

After the building had been raised to a height of about 60 feet a pair of long track timbers were laid on top of each line of cribbing, and wooden rollers 8 inches in diameter and 4 feet long were inserted about 12 inches apart on centres between them and the sills, and the building was moved back on them about 40 feet to the face of the cliff. This was accomplished by two nine-part tackles with 2-inch rope and fall lines about 1,200 feet long. In the front of the building the tackles were attached to vertical oak timbers bearing at the upper end on the saddle pieces over the needle-beams, and at the lower end on the main roller timbers. The tackles passed under the house and were anchored at the face of the cliff to horizontal longitudinal timbers bearing across the runway timbers under the rollers. The lead lines were carried through snatch blocks to two 2-horse-power windlasses on top of the cliff.

After the house was moved, the crib-work which had been released was taken down and used in building up the second section of cribbing from the roller level to the top of the cliff as the building was continuously raised the remaining 60 feet to the top of the cliff. It was then rolled over beyond the face of the cliff and moved in the usual manner on inclined runways to the new location. The total weight handled was about 1,200 tons and no mishaps occurred during the progress of the work. All the plant and materials used were regular stock from the contractor's yards.

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WALLPAPER AND HANGINGS.

Apart from considerations of the design and the appearance of a wallpaper under certain conditions, the architect should also consider the means of its manufacture and the materials of its composition, says a writer in the Architectural Record. Wallpapers and hangings may be divided into two main classes: (1) the printed papers, and (2) the flock and relief. With regard to the first, the printing is done either by hand or machine. In the hand printing the colors of the different blocks are not applied until after the color is dry, while in those printed by machine the various colors follow on wet, the whole design being printed as the roll of paper passes through the machine. It will, of course, be easily understood from these conditions of manufacture that hand-printed papers have greater sharpness and accuracy, each color being distinct and separate, while in the machine work they frequently run together more or less. The hand-block printer also has the advantage of being able to print two or three pieces at very little extra expense, whereas with machine-made papers the cost of "setting" a machine is so considerable that it does not pay unless a large quantity of paper is printed, the consequence being that after a year or two it becomes impossible to repair a room with machine-printed paper or to repeat the same design if desired. The flock papers are made by printing on the paper with a cementitious material and then scattering finely chopped wood fibre evenly over it. As each different color requires to be worked separately and strewed with wood fibre, the process is, of course, very expensive. The coverings in relief are prepared by a variety of special processes which are to be referred to the general principles of embossing by the application of pressure or moulding when in a plastic or flexible condition, either separate or combined. With regard to the materials of which wallpapers and hangings are composed, the colors are either distemper or oil. The distemper colors have a tendency to fade in sunlight, though much depends upon the colors chosen and the composition. Papers printed in oil colors always darken and yellow—i.e., the ground does—giving a dingy and shabby appearance unless the designer has made allowance for it. When new, they are often good in effect, though, I think, they never equal distemper papers. They have one advantage over distemper in allowing a tint to be gradated by the mezzo-tint process. Papers printed in oil colors may be twice sized and then varnished so as to allow washing, but a varnished paper is always unpleasant. Papers sold as varnished ready for hanging should be avoided, for they are varnished with a quick-drying, hard, white spirit varnish, and have very little durability. If a varnished paper is desired it is best to varnish it after hanging. One little point worth noting in connection with varnished papers is—that allowance should be made in the paint of the room for the yellowing of the varnish.

In wallpapers from reputable manufacturers there is no danger to be apprehended from poisons in the colouring matters, but from the smaller manufacturers a warranty should be obtained that the green papers are free from arsenic (even then it is best to test them oneself) and that papers of other colours are free from copper or mercury. "Pulp" papers have the back of the paper the same colour as the ground of the front. Papers in which the ground or pattern, or both, have a sheen as of satin are known as "satin" papers, and are made by mixing Spanish white with the colouring matter and polishing it with a burnisher; such papers are very susceptible to damp, and should be protected by a lining-paper. The materials of which the coverings in relief are composed are mainly paper, wood, fibre and cloth. One well-known hanging which claims to be the only material solid both in colour and relief is composed of oxidized linseed oil and wood flour mixed with colours and a few minor ingredients. Another is made by placing wood pulp in moulds to a considerable thickness; others are composed of asbestos, canvas or silk refuse.

The American Window Glass Company controls an invention for the manufacture of that article for which they are said to have refused ten million dollars. It is designed to reduce the cost of production by dispensing with blowers, gatherers and snappers, all of whom are high-priced men. For a year past, three of the machines have been secretly operated, all imperfections and drawbacks eliminated and overcome and the company has installed 12 of them in the old De Pauw plant at Alexandria, Ind., this plant being newly equipped throughout for the making of glass.

Dr. William Collinridge, medical officer of health to the Corporation of London, has issued a report in which he suggests that all owners of kitchens and above-ground bakehouses be informed that a standard of requirements has been drawn up by the Corporation and that upon complying with this a certificate will be granted. The proposed standard requirements are set out at the end of the report. They stipulate smooth impervious floors, walls and ceilings, double covers to inspection chambers, minimum height of rooms 8ft., minimum cubic capacity 1,500ft. and not less than 400 cub. ft. per employee, temperature not to exceed 80 degs. Fahr., each bake-house oven furnace to have a flue for carrying off sulphurous fumes and an outlet for heat and steam immediately above the oven door; underground kitchens to have inlets for ventilation at least 12in. above the footway or ground level, proper lavatory and w.c. accommodation, storage water cisterns with dust-tight fixed covers, shelves to be 2in. from the walls and hose to be provided for washing the room efficiently.

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AN ENTIRELY CONCRETE BUILDING IN HALIFAX.

On the illustration sheets of this number is a building owned by A. M. Bell & Co. in Halifax, N.S., in which the walls and piers are entirely of concrete and steel bars. This forms quite a precedent in Canada, as in the majority of cases of buildings of concrete construction we usually find the facings of brick, stone or marble, but in this building all the face work and even the mouldings are of concrete.

The walls were constructed in the usual way by building up wooden sheeting on each side and filling in the concrete. They are twenty inches thick to the top of the first floor, sixteen inches to the top of the second and twelve inches in thickness for the remaining three upper stories, the building being five stories high. The piers on the two frontages are four feet wide and two feet thick.

The mouldings which stand out strongly in the illustrations were formed by building up the reverse mouldings in wood, thus forming the concrete mouldings in one piece with the walls.

Cracks, due to the expansion and contraction of the concrete, were prevented by building up the main piers in both frontages separately with boxes built in recesses to receive the ends of the lintels which were built in later, thus forming joints where the movement due to expansion and contraction could be taken up. These lintels, as also all the piers and walls, were reinforced by iron beams and twisted steel rods, while iron rods were laid horizontally in the walls every four feet of the height, and twisted iron rods were run vertically the full length of the piers.

The concrete used in the construction was of various grades and qualities, that used for the walls being composed in the proportion of seven parts of sand and gravel to one of cement; that in the piers of five parts of sand and gravel to one of cement, while the mouldings were constructed of cement composed of equal parts of sand and cement.

Within the interior of the building is a large two-storey vault with double 8-inch cinder concrete walls.

The building was designed by R. A. Johnson, architect, successor to Hopson Bros. of Halifax, N.S., and constructed by Geo. B. Low, contractor, of Halifax.

PUBLICATIONS.

A fourteenth edition, revised and rewritten, of the Architects' and Builders' Pocket Book, by Frank E. Kidder, C.E., Ph. D., has been published by John Wiley & Sons, New York. It contains 1650 pages, size 6½x3⅞, with 1000 illustrations. Price, in morocco binding, $5.00.

The McGraw Publishing Company, 114 Liberty Street, New York, have recently issued an instructive work by Frank W. Skinner entitled "Types and Details of Bridge Construction." The book comprises 294 pages and is liberally illustrated. It is printed on heavy paper and substantially bound in cloth. The price is $3.00.

When melting size for distemper keep it well stirred, and it should not be allowed to get beyond a lukewarm state. If very hot when mixed with the whiting the distemper will be "runny" when cold instead of a jellified mass.

NOTES.

Mr. Peter Brass, one of the oldest and most highly respected architects of Hamilton, Ont., died a few days ago following an operation in the general hospital of that city.

Two strikers were picketing the entrance of an alley during the strike at the factory of the Kellogg Switchboard & Supply Company in Chicago. A non-union man came out of the factory and started across the street. One of the strikers picked up a brick. As he looked at it an expression of disgust came over his face and he threw it down.

"Why didn't you throw it at the scab?" asked the other striker.

"Because it's a non-union brick."—The World's Work.

The New Century Refrigerator & Manufacturing Company, Limited, of Dundas, Ont., have their large new factory completed and in full operation. It is splendidly equipped with the best and most modern machinery and systematized so as to reduce the amount of labor to the minimum, and is one of the most complete wood-working factories in Canada. There are large and extensive dry kilns by means of which all lumber will be thoroughly seasoned before being manufactured. The company will make a specialty of hardwood veneer doors with built-up bodies, which they claim are unshrinkable and are guaranteed not to warp or twist. They are made in modern designs, artistic in appearance and equal in construction and finish to any door on the market. They will also give close attention to architects' special designs of doors and trims. Agents will immediately be appointed in the different districts, and they will doubtless find their products a profitable line of goods to handle.

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Prices for advertisements will be sent promptly on application. Orders for advertisements should reach the office of publication not later than the 12th, and changes of advertisements not later than the 5th day of the month.

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Contributions of value to the persons in whose interest this journal is published are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

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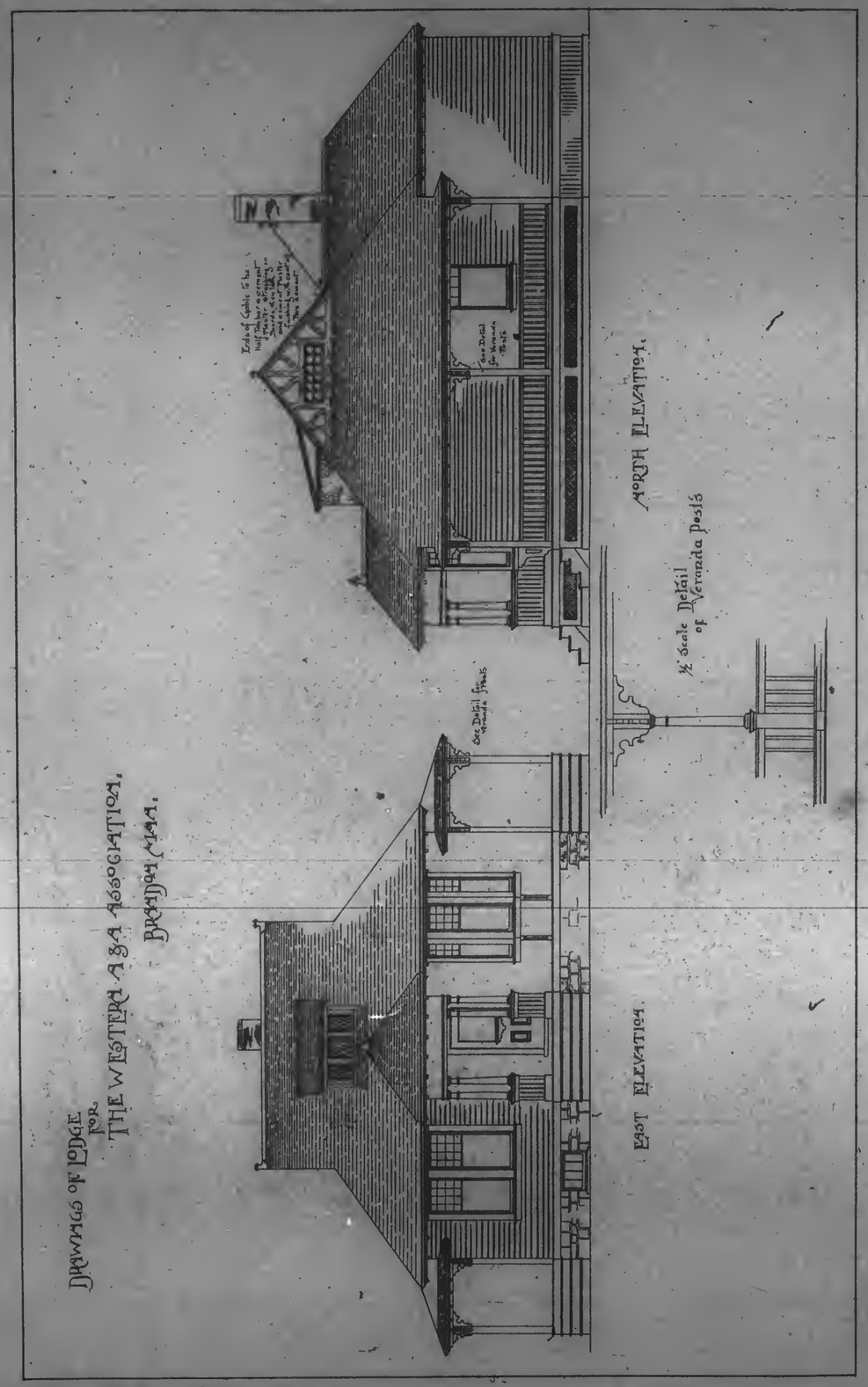

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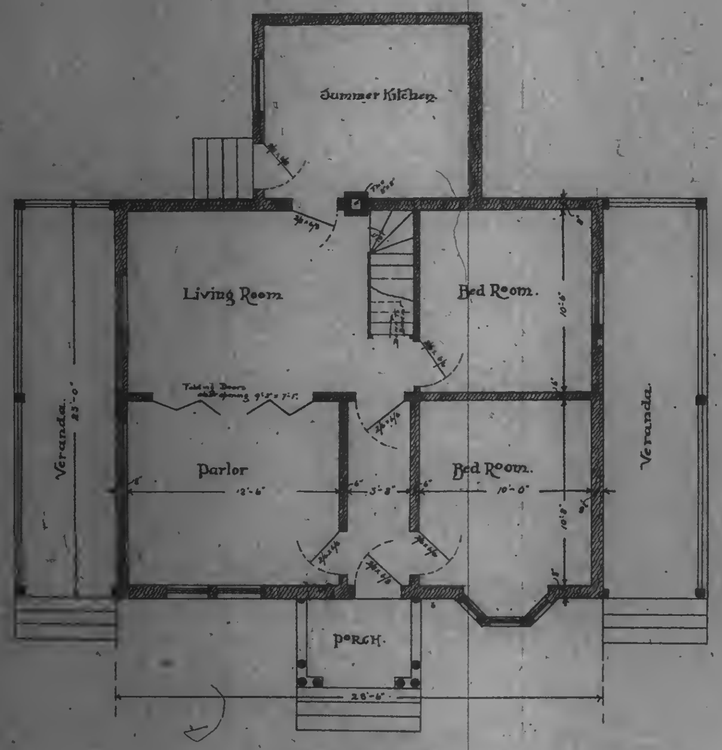
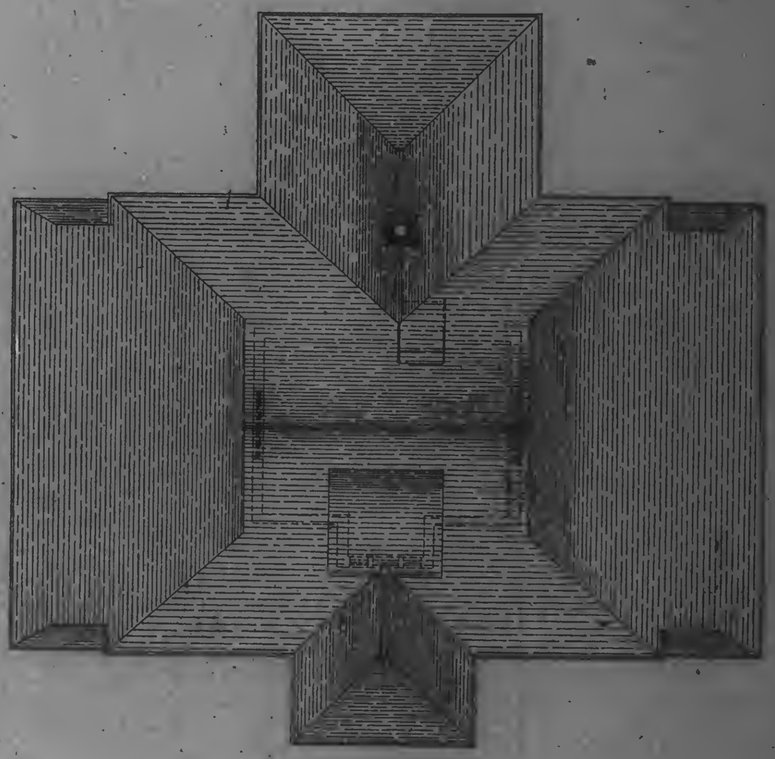


GROUND FLOOR PLAN.



ROOF & ATTIC PLAN.

PLANS OF LODGE FOR WESTERN ART ASSOCIATION, BRANDON, MAN.
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SEPTEMBER, 1904

The Canadian Architect and Builder

VOL. XVII.—NO. 202. OCTOBER, 1904.

ILLUSTRATIONS ON SHEETS.

Cottage at Brandon, Man.—W. Nicholson Lailey, Architect.
House for Mr. Sanford Evans, Winnipeg, Man.—George Brown, Architect.
Fireplace, House in Queen's Park, Toronto.—Sproatt & Rolph, Architects.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

House in Queen's Park, Toronto—Sproatt & Rolph, architects.
Stair Hall, House in Queen's Park, Toronto—Sproatt & Rolph, architects.

CONTENTS

Editorial	161-162	Architectural Classes	172
Opening Lecture of the Department of Architecture, McGill University	163-164	Cologne Cathedral	172
Ventilation	165	Northwest Notes	173
The Architectural Association and Its Work	165	Difficulties and Methods of Plastering in Winter	174-175
Ferro-Concrete Construction	165	German Regulations for Reinforced Concrete	ix
By the Way	166	The Action of Lightning on Buildings	x-xi
Cement for the Northwest	166	The Apprenticeship Question	xii
Montreal Notes	167	Armored Concrete Vaults	xiii
Church Heating and Ventilation	167	New Cement Brick Making Machine	xiii
Some Notes on Motor Houses	168	A New Plumbing Device	xiii
Chains Used in Building Construction	169	Cement Building Stone	xiv
Design and Craftsmanship	170-171	Business Notes	xiv

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REMOVAL NOTICE.

On the first of November, 1904, the Winnipeg office of this Journal will be removed to Rooms 720 and 721 of the new Union Bank Building. This building, which is just nearing completion, is thoroughly fireproof and in construction and equipment is the equal of any on the continent.

A standing invitation is given readers and friends of the Journal to call when in Winnipeg. Any possible information or assistance will be gladly furnished them.

Belgian vs. British Structural Steel.

The large trade which a few years ago was being done in Great Britain by Belgian and German manufacturers of steel joists and girders, is reported to have been killed as the result of tests and inspection to which the material was subjected by users in Great Britain. The trade is now in the hands of British firms whose product is not so cheap, but is uniform and reliable in quality.

Safety of Elevators

The Coroners' Jury appointed to enquire into the circumstances attending the death of Dr. McPhee, of Ottawa, who was recently crushed in an elevator, returned with their verdict of accidental death the following recommendation :—"We would recommend that the city by-law governing elevator operators be changed, so that no operator be less than eighteen years of age, and no operator be engaged without first having a certificate as to competency from the building inspector."

Building in the West

Several Toronto contractors are finding a profitable field of operations in Winnipeg, where building is more active than in any other city on the continent. The value of building permits issued for the nine months ending September 30th, was in round figures $8,000,000, a sum in excess of the expenditure for this purpose in any other city in the United States or Canada, not excepting New York. In spite of this large expenditure, it has not been possible to meet the demand for houses. During the past summer a considerable number of families lived in tents. Some of these have been unable to secure other accommodation, and are at a loss to know where to find shelter during the coming winter.

"Fire-Proofed" Wood.

The Mayor of New York as the result of strong pressure has withheld ratification of the ordinance recently approved by the Board of Aldermen of that city compelling the use of fire-proof trim in the erection of new buildings above 75 feet in height. Builders asserted that the ordinance would be valueless except to the

manufacturers of so-called "fire-proof" wood. The term "fire-proof" they claim to be a misnomer as applied to wood. Experience is said to have demonstrated that its fire-proof qualities are dead within three years at the longest. We have seen samples of wood impregnated with chemicals, which could not be burned, but cannot say anything regarding the durability of the process. If not durable, the use of such material, involving as it does considerable extra cost, would be of little value, and must prove a hindrance to building and an added burden in the form of higher rentals to the public. On the other hand the great losses caused by fire renders necessary building laws that will insure as far as practicable the use of non-inflammable materials.

Building Regulations.

A clause of the new building by-law of Toronto provides that walls of new buildings exceeding 35 feet in height shall be built in cement mortar. In the case of the first church building to be erected since this by-law came into operation, the walls are 28 feet in height, but the gables exceed 35 feet in height. The city architect has ruled that the entire walls must be laid in cement mortar. This will entail an extra expenditure of $500 in the construction of the building. The architect offered to increase the width of the foundation walls by 4 inches above the thickness required by the by-law for ordinary lime mortar construction, but the city architect insisted that cement mortar must be used throughout the entire construction. This would seem to be a doubtful interpretation of the provision of the by-law and one that does not appear to agree with common sense. The gables of the building in question do not support any weight and constitute but a very small percentage of the total wall area. This case emphasizes the fact that not only must building by-laws be very carefully framed in order that they may be equitable, but also that they should be interpreted in the light of common sense if hardship and injustice is not to result from their operation.

Patents on Skyscrapers.

Mr. Leroy S. Buffington, an architect of Minneapolis, has brought suit in the United States Circuit Court of Appeals at Chicago against the National Safe Deposit Co., owners of the first National Bank building now under construction in that city to recover damages for alleged infringement of a patent granted to him covering a method of employing a steel skeleton in building construction. Mr. Buffington's attorneys claim that his patent, which was granted on May 22nd, 1888, is a valid one, and broad enough in its claims to cover all the buildings of the steel skeleton type erected throughout the United States in recent years. The claim for infringement is specially based upon the use of essential features of the patent, viz., a shelf or projection on each story to carry the outer walls for the succeeding story, whereby expansion and contraction due to changes of temperature cannot endanger or seriously affect the structure, and a continuous post consisting of a plurality of plates, placed side by side and diminishing in number towards the top; another feature is the employment of non-conducting packing between the veneer and the steel skeleton. Mr. Buffington proposes to institute other suits for a similar purpose. The outcome will be watched with much interest by building owners, architects, contractors and all others in any way identified with the erection of buildings.

Sand Bricks.

At several points in Canada experiments are being made with the manufacture of sand bricks. What advantages are claimed for these bricks above those manufactured by the ordinary method has not been learned. A recent test in Europe of ordinary lime-sand bricks of good quality and clay made bricks of similar quality demonstrated that the latter were less absorbent. The present would appear to be an opportune time to make known the advantages of sand bricks and to place them on the market, in view of the exceeding scarcity and high price of ordinary bricks. In Toronto at the present time best quality common bricks are reported to be selling as high as $14 per thousand. This fact is causing owners of property and especially speculative builders to hesitate about starting the erection of new buildings this autumn. It is estimated that by reason of the enhanced prices for materials and labor, the cost of building this year has exceeded that of 1903 by 10 to 20 per cent.

The Winnipeg Exhibition.

Financially the Dominion Exhibition held recently in Winnipeg must be counted a success, the management having in hand a cash surplus of $6,482. The attendance was also measurably satisfactory, totalling 200,000 persons. Viewed from the exhibitors' standpoint, and as the precursor of successful Exhibitions in the future, our information is that it left much to be desired. The arrangement by which the exhibits were placed in the rear and the side shows in front, worked out badly for the exhibitors. We have been told that a large percentage of visitors never got beyond the side shows and left the grounds without seeing the exhibits at all. Consequently the thousands of dollars expended by eastern manufacturing firms desirous of bringing their products prominently before the notice of the people of the west, were to a large extent wasted. The exorbitant charges for accommodation demanded by hotels and boarding houses militated against the success of the enterprise and is calculated to have an even more serious result in deterring persons who did attend from visiting future Exhibitions in the same city. The lack of interest shown in the exhibits, combined with the excessive charges for accommodation decided a number of the eastern exhibitors to quit the Exhibition before the closing day, while visitors living within reasonable distance of Winnipeg made a point of spending only a part of one day in the city, and of returning home in the evening. Before the people of Winnipeg can hope to induce either residents of the west or outsiders to attend in large numbers any future enterprise of this character they must give assurance that care will be taken to remove the causes that that have occasioned dissatisfaction this year.

The Lac du Bonnet Mining and Brick Company, of Lac du Bonnet, Man., reports an increasing demand for bricks. Their output this year has been over five million and a million of these have been fine pressed brick for face and finishing purposes. They are now engaged on an order for 1,000,000 brick for the new power house of the Winnipeg General Power Company, and another order for 100,000 for the new immigration sheds at Winnipeg.

OPENING LECTURE OF THE DEPARTMENT OF ARCHITECTURE, McGILL UNIVERSITY.

By Prof. Percy E. Nobbs.

Strictly speaking, this lecture belongs to the third year of the course for the new degree of Bachelor of Architecture and as its theme is one of very general application and paramount importance to designers, I have ventured to invite the presence of others besides my third year students.

In naming the course The Building Trades the intention has been to avoid the use of the word Crafts, which is perhaps more applicable to the subject matter about to be covered, because that word has during the last twenty years come to be associated with a certain amateurishness in the field of art which the ancient craftsmen would have been the last to approve. Also, because during the last decade the "Arts and Crafts Movement" as it has been called, has tended more and more to countenance certain eccentricities in design which its loudest and most strident supporters have dubbed "originality". Having set up a brazen calf in the wilderness so to speak, the cult of the new art (or L'Art Nouveau) has resulted, and the word "craft" is never out of the mouth of those who follow that way.

I do not propose at the present juncture to set forth my views on the training of designers further than to name to you the mental elements which I think are combined to form the mental image of an unmade and rightly designed possible object. This high function of conceiving an unmade thing is the nearest to actual creation that man can attain to.

It is this line of thought that Mr. Kipling has made articulate in his verses "To the True Romance":—

"What is is thine of fair design in thought and craft and deed.
Each stroke aright of toil and fight that was and that shall be,
And hope too high, wherefore we die, had birth and worth in thee."

And again in "L'Envoi"—a celebration of an accomplished work with all the imagery of building operations, beginning:—

"My new cut ashlar takes the light where crimson blank the windows flare;
By my new work before the night, Great Overseer I make my prayer.
If there was good in that I wrought, Thy hand compelled it Master thine;
And where I failed to meet Thy thought, I know through Thee the fault was mine."

That is the way to regard the function of design—as a thing with a right and wrong about it; not a mere matter of taste and whim. Why the very phrase the "Architect of the Universe" makes the paltryness of the vast majority of the architectural performances of the last century appear as sheer blasphemy by contrast.

Well, to return to these same elements, they are:

Firstly, That sympathy born of knowledge, or knowledge born of sympathy, I know not which it is, that enables the designer of a tea spoon or a town hall to realize the full uses of the object he is to conceive. This element is made up of all experience.

Secondly, and of equal importance is a knowledge and sympathy concerning the material and technique (for these things are interdependent) by which the designer's idea will gain tangible concrete existence.

Thirdly, we have scholarships in art which constitutes our heirship to the vast heritage of past traditions, past masterpieces, past failures.

And fourthly, there is the sense of proportion which some men have and most men lack,—this is not a matter of rule or teaching, and the schools of architecture which have professed an exact science of proportion as a thing which can be taught have failed absolutely to leave behind them monuments of any human interest. Cold stones at the best. I refer particularly to the influence of Vitruvius.

It is not to speak of the attainment of knowledge of "what is wanted," nor of scholarship, nor of proportion, that I venture to intrude upon your time, but to discuss very briefly a few examples of the influence of material and technical process on design. In the Ruskinite literature truth is made out to be the touchstone of good architecture, and "Gothic honesty is held up as a moral precept for our architectural regeneration." Now a great deal of the Ruskinite literature, especially with regard to architecture, can only be regarded as charming prose but in thus claiming for truth a place in design from which it had been systematically kept out for a matter of a hundred years, Mr. Ruskin and his followers may be said to have lit the torch which resulted in the revival of sane design in England and which despite the temporary aberrations of the "Art Nouveau" movement is making steady progress all over Europe and in the States.

Now the great quality of truthfulness can only be obtained by having due regard for the natural limitations of materials themselves and the techniques to which they are subjected.

Of course one of the most fertile sources of change and evolution in style has been the translation of forms originated in one material to a second, and a subsequent amelioration of these forms in adapting them to the new material and the changed technique. Not to dwell upon the wooden origin of the Greek orders a few examples from Gothic work will make the point clear.

We have in the 13th and 14th centuries, the evolution of window tracery by gradual stages from groups of detached lights to a highly organized system of window design—and all evolved in stone! In the 14th century we have the miniature reproduction of stone tracery in wood panelling and screen work with certain changes in the forms due to the wood and the joiner's tools being substituted for the stone and the mason's chisel, and a system of framed panelling dominating the design of the whole. Then, later in the 15th century, this system of framed panelling is transferred back to stone wall surfaces and ceiling vaults in the perpendicular style of Gothic. This phenomenon, Mr. Prior in his history of Gothic Art in England refers to as "the discovery of the principle of panelling by which was got a scheme of surface distribution that employed partition horizontally and vertically as a reasonable exposition of space."

Then again the diverse ways man has found to deal with metals or even the same metal have afforded fruitful sources of artistic inspiration. Let us for a moment compare wrought iron and cast iron. We all know that these two things attain different kinds of strength and are formed in different ways. We all also know that wrought iron is continually being copied in cast iron. (See any trade catalogue).—We are also aware of the reason,—cheapness; and the result is a highly fragile and unreliable kind of a railing from the

utilitarian point of view and utterly lifeless, stupid and ugly from the artistic standpoint.

A clumsy, thickset heaviness is right and proper and beautiful in cast iron while a lacelike slimness is equally characteristic of the material and technique of wrought iron. Here I have the cast iron parapets of two bridges in St. Petersburg which as cast iron design leave nothing to be desired and some English XVIICentury wrought iron which shows at its best the full influence of the hammer technique.

BELTON HOUSE, LINCS:
Private Entrance to Churchyard.

Cast Iron Parapet, Nicholas Bridge, St. Petersburg.

One more example, and this from the breakfast table of the average boarding house will show how general is this disease of blatant sham in the field of design.

Look at the ordinary cream jug or sugar basin. It is facetted all over with a design of geometrical structure natural to cut crystal and to nothing else. But is this crystal? and is it cut? I trow not! It is very common glass, it is moulded and the facets are so futile that they absorb more light than they reflect. Why was the sugar basin made so ugly?—for before

Cast Iron Parapet, Alexander Bridge, St. Petersburg.

it was squeezed into its mould it had all the grace and beauty of a ball of glass in the blowing. I suppose because taste is thoroughly depraved and the ordinary man finds a beauty (to him it is beauty) in the imitation of what is rich and rare and a misguided satisfaction in getting the appurtenances of life cheap.

Enough has now been said to prove the contention that materials and techniques have it in them if rightly apprehended to suggest a very great deal with regard to the decorative treatment of objects, and it has incidentally been made abundantly evident that no good results from avowed and unadapted imitation in one material of another or of a superior by an inferior technical process.

In the course we are initiating work of the different building trades will be studied as such regardless of historical sequence, and the masterpieces of all periods will be called in to illustrate the best way of doing things at the time when they were done best.

Designs for details of all the trades will be prepared not as tricky sketches but as working drawings.

By this means I hope the students will get at least a glimpse of the best workmanship of our civilization during the last 3,000 years—XVI Century plaster work and XIV Century glass; VI Century mosaics and XII Century marble inlay; XV Century carving in marble and XIII Century carving in stone. From Italy and England, Constantinople and Rome, France and the Low Countries and sunny Spain.

When the student understands Gothic joinery construction and Renaissance iron work, Modern plastering and Ancient glass painting, there is some profit for him in the study of historical styles and ornament. Without such knowledge such study can only be hurtful to any instinct for design he may possess or which might be induced.

This, gentlemen, is the message as I take it of the Gothic Revival of the 2nd half of the XIX. Century—a movement which by the way has had its chief effect for good in classic design. To treat materials with sympathy and techniques with understanding; to ask what shall this be made of or how will that be wrought before the pencil is committed to the paper; and above all things the negative precept not to sham.

In the burnt district of Baltimore a company is about to install a central heating and refrigerating plant. Prof. Woodbridge is said to be making a study of Washington public buildings for a similar purpose. The use of such a plant should greatly reduce the fire risk and consequently the cost of insurance. It is proposed to install meters which will register the amount of condensation in the pipe lines, so that the consumer will pay for only the amount of steam used.

VENTILATION.

By Robt. Bennett.

Ventilation is a term applied to the method by which a due supply of fresh air is maintained in buildings and other confined places.

The word was invented about 200 years ago by Dr. Desaguliers, a well known scientific man of that time, who devoted a great deal of time and money and skill towards improving the sanitary conditions of buildings, which at that time were considered very bad. He invented a "fanning wheel," or, in other words, an "air propellor," which was worked by manual power, and the man who worked it was called the "ventilator." The word has since been divorced from its original meaning and is now used to signify an opening in a building through which air may, or may not, pass, according to circumstances.

Everybody knows that a supply of fresh air is necessary for all living things, even for plants and vegetation. To cover the head with a cloth for a short time produces a sense of oppression, and on its removal a feeling of relief is experienced. The heat of the person's breath causes oppression. People often say of a crowded building "it is too hot," whereas the discomfort is caused chiefly from the impurity of the atmosphere.

Many diseases are produced by the impurities in the air. Continued breathing of impure air lowers the tone of health. Consumption and scrofula are attributable to vitiated air. The instance of the confinement of 140 Englishmen in the Black Hole of Calcutta in the year 1756 is illustrative of the fatal effects of breathing foul air. After 10 hours of imprisonment therein only 23 persons were found alive. Fresh air is essential as the purifier of disease and also for resisting diseases. The use of gas adds greatly to the impurity of air. The poisonous effect of gas combustion has been the cause of many deaths.

The subject of ventilation is being sadly neglected. Churches, houses, schools and public buildings are being built without proper regard to necessary ventilation. Those responsible for the building of churches and other places of worship seem to be the worst offenders in this respect. For instance, a church is planned and submitted to, and passed by a fixed authority—it is difficult then to introduce changes. The usual form of church building, copying more or less the beautiful architecture of the 13th or 14th centuries is by no means an ideal form from a sanitary point of view, whatever it may be in other respects. It is generally built in the form of a nave and side aisles, lighted by clerestory windows, giving practically (including the chancel) four ceilings of different heighth, making it most difficult to extract the air at the level of the roof. The clerestory windows chill the warm air as it rises, and send it down in the form of a cold draught on to the heads of the congregation. The roof is lofty and dark, necessitating a large amount of light, and as a rule about twice as much gas is burned as is necessary. Nonconformist places of worship are even worse on account of the frequency of galleries and consequent crowding.

How often do we see the windows of a church opened when one or two of the congregation have fainted from the stuffy atmosphere of the buildings. Only recently in a west end church of the city of Toronto I was an eye witness to that sort of thing—the service had only just commenced and everyone apparently felt the discomfort of the badly ventilated place—when two ladies fainted and were taken into the vestry by the wardens—then the windows were opened to admit fresh air. The fresh air came in with a mighty rush which caused a great number of the worshippers to look askance and to draw their garments closer around them, in fact I noticed two gentlemen turn up their coat collars during the prayers; needless to say the service was not so enjoyable in consequence. We often catch severe colds coming out from churches, concert rooms, public buildings, theatres, etc., from that very cause.

Dwelling houses, too, suffer from lack of proper ventilation. It has often been remarked that we are apt to prize but lightly what we possess in abundance, and it is a fact that cannot be denied that the two most important foods on which human life depends, viz., pure air and pure water, are by the great majority of us least esteemed. These two foods, more especially the former, are so abundant that we need pay very little attention to obtain them. We should recognize the importance then of supplying every building and habitual dwelling with proper ventilation. In thousands of houses in our great cities the most elementary principles of ventilation are systematically ignored.

People who would take the greatest care not to drink polluted water, are yet careless of breathing impure air and seem to forget that one may be quite as dangerous as the other—personally I am of opinion that impure air is really more dangerous than impure water, since the air is taken directly into the lungs and comes in contact with the blood more speedily than water which enters the stomach. I do not propose to write with medical authority at all, but simply from a little observation of my own. I believe that ventilation is an exact science, admitting of exact results, and if everybody could be induced to believe the fact that bad air was detrimental to health; if the fact of a room being close or stuffy was regarded as disgraceful; if people refused to attend a badly ventilated place of worship; then the architects, the builders and the occupiers would soon find means to alter the existing state of things.

FERRO CONCRETE CONSTRUCTION.

A lighthouse of ferro-concrete has just been constructed at Nicolaieff, near Odessa. The height is 131 ft., the diameter at the base 28 ft. and that at the top of the shaft 6ft. 7ins. The service-room which is 14ft. 3ins. in diameter, is corbelled out, and thus overhangs 3 ft. 10 ins. on each side of the tower. For purposes of design the tower was considered as a tube firmly fixed at one end and acted upon by a distributed pressure, due to wind, 56·4 lbs. per. sq. ft. The foundation is sunk only 8 ft. 3 in. below the surface of the ground. The skeleton consists generally of upright rods and of circular rings, the surrounding concrete being mixed in the proportion of 660 lbs. of Portland cement, 1 cu. yd. of ballast and half a cubic yard of sharp sand. In order to ensure that the concrete takes a firm hold of the framework the latter is brushed over with grout prior to the concrete being run in. It is claimed that a saving of 40 per cent. is effected by the use of the ferro-concrete. The weight of the building is given as 453 tons, of which 342 tons only represent the weight of the ferro-concrete, whereas the weight of such a light-house put up in the ordinary way would be 1,343 tons.

BY THE WAY.

In consequence of the destruction wrought by recent fires the Norwegian government propose to make compulsory the use of brick in building. Hitherto the decision as regards materials to be employed has rested with the municipal authorities, and wood being plentiful and cheap, has been largely used.

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As a rule the streets of Chinese cities are badly paved, but one of the coast cities is an exception in this regard. The streets of this city have been paved with grind-stones, i. e., stones originally employed for the grinding of meal, but which, when partially worn out and defective, have been put to this new and useful purpose. They number many thousands and must therefore have been collected throughout a wide district.

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The plan adopted in Toronto and other Canadian cities of placing a band of brass having an inverted edge round the trunks of shade trees to prevent the tussock moth from climbing to the top and destroying the tree, is in tropical countries applied to the cups of the small iron supporting columns of buildings to prevent destructive insects such as the white ant and all sorts of vermin from climbing beyond them. The flight of steps leading up to buildings in these countries either stand in pans of water or are painted with grease to render them vermin proof.

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That well-known and usually well-informed journal the English Builder is considerably astray in some of its recently published remarks on cement construction in Canada. It is not the fact that cement coffins are largely in use in Canada, indeed so far as we know they are not manufactured here, nor is the statement that concrete steel construction appears to have made little headway in Canada, much nearer the mark. Contrary to the impression which the editor of the Builder seems to have gained—building methods and materials in Canada are quite as modern as those of the United States.

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It is very galling at times to have to follow one's own advice or to swallow the medicine prepared for another patient, so no good American can wonder that our newspaper writers are writhing in indignation at the audacity of the Canadian Government in ordering the deportation of certain civil engineers holding important positions in the work of constructing the new Canadian transcontinental railroad, the Grand Trunk Pacific. What right has Canada, or any other country, to protect its citizens by enacting an "alien contract labor law?" Is not that one of our own most precious inventions, and can't we do something to prevent an infringment of our rights in it? One is sometimes tempted to believe that Americans nowadays are a bit too strenuous to be wholly satisfactory occupants of this world.—American Architect.

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Mr. Robert Williams, F.R.I.B.A., of London, has been commissioned by an Egyption Pasha to prepare plans for a Mosque to be erected for the benefit of the Mohammedans residing in the great metropolis. The plans which are to be submitted at Constantinople for the approval of the Sultan, show a facade 120 feet in length and a longitudinal measurement of 150 feet. The style is Saracenic, or the mediaeval architecture of the Arabs. The building will have a base of polished red granite probably from the old Assouan quarries. The walls will be of red Mansfield stone, relieved with Doulting and Portland stone. The details of the interior will be richly done in marble and Welsh jasper. That part of the floor where the people prostrate themselves will be of teak, and the furniture of oak and teak. The whole building will be surmounted by a beautiful minaret, with balconies and galleries, about 200 feet high. Groups of turrets will also surmount other corners of the mosque, and these will be ornamented with golden spires and crescents.

CEMENT FOR THE NORTHWEST.

In view of the certainty that cement must enter largely into the construction of buildings in the Canadian Northwest, enquiry was recently made of a number of the cement manufacturing companies and wholesale dealers in Eastern Canada regarding the possibility of successfully manufacturing cement in the Northwest. They were asked it they had made any investigation to determine whether the necessary materials for the purpose were available, and if it should be found impracticable to manufacture the material in the west, from what quarter the supply would be likely to come. To these enquiries have come the following replies :

Marl and clay—the two raw materials used in the manufacture of artificial (the best) Portland Cements, are to be found in every province of Canada. Lime stone takes the place of marl where the latter is not found, but is deficient in quantity of carbonate of lime compared with marl or chalk. There is no reason why in the Northwest Portland Cement should not be made profitably. The Canadian Pacific Railway started a factory near Vancouver some years ago on a small scale for their own requirements and ran it successfully as far as the quality of the material turned out was concerned.

D. McNALLY & Co., Montreal.

DEAR SIRS,—Replying to your circular letter of the 22nd inst., would say that at present we consider it ridiculous for anyone to think of promoting any more cement factories in Canada. Even with the North-West market and without the several factories now under construction in Ontario, the Canadian factories have been selling at a loss in order to get rid of their output. After the factories that are now being built are completed in Ontario, we will require the whole of the Dominion as our market if it is to be made a paying industry. We would rather see cement factories in the west than to have foreign cement go there but under existing circumstances, consider it unwise and unprofitable for anyone to build another cement factory in Canada.

THE HANOVER PORTLAND CEMENT CO., LIMITED.
HANOVER, ONT., Sept. 24, 1904.

DEAR SIRS,—Replying to your inquiry we understand from reports that the materials for making Portland Cement exist in some localities in Manitoba, but as to their extent and accessibility, we are not aware. Our own impression is that reports of the political surveys of the several districts would give more accurate information. In the meantime it appears to us that the supply of Portland Cement for the North-West Territories and New Ontario, must come from Ontario and other outside points.

THE COLONIAL PORTLAND CEMENT CO., LIMITED.
WIARTON, ONT., September 24, 1904.

DEAR SIRS,—Replying to your inquiry of the 22nd, I have not heard that the necessary material is available in the Northwest for the manufacture of a high-grade cement, but I do not pretend to have examined the question closely.

C. I. DESOLA.
MONTREAL, 23rd September, 1904.

GENTLEMEN,—Replying to your favor of the 22nd would say that we have not given the question you mention sufficient thought to express an opinion.

THE ONTARIO PORTLAND CEMENT CO., LIMITED.
BRANTFORD, ONT., Sept. 23rd, 1904.

MONTREAL NOTES.

The city of Montreal though not one of the largest cities in the world has yet that cosmopolitan character which is generally found in the largest cities. Perhaps it would be more correct to say that it has that cosmopolitan want of character which belongs to huge masses of humanity moving together and mixing and touching continually yet without any distinct common aim and without even sentiments in common except always on the largest and most broadly human issues. In the city of London, a Chinaman might wander long enough without meeting a single individual with whom he could share, one, even the slightest, of his celestial reflections. But should the same man chance to meet some sudden accident the first dozen passers by would minister to his necessity with as ready and genuine a sympathy as if he also were a son of Father Thames. The further apart we find our lines of life to be cast the more glad we are when we can meet one another on the common ground of simple human nature.

The larger the city the more manifold become the interests of its inhabitants and the more thoroughly disintegrated does sentiment become. In this way such a thing as 'esprit de corps' almost ceases and can only be revived by an appeal to the more elemental bonds of society. Thus cities go on shaping themselves in a shapeless way.

This sort of thing takes place more readily where there are initial conditions tending to keep people apart and in Montreal such a condition exists in the division of the people into French and English sections. The two races are held apart more than anything else by that strange division that a difference of language involves. Everything that tends to freedom in the interchange of ideas and sympathies helps to knit people together and strengthens them in all common thought and effort. Everything on the other hand which clogs this ready interchange must tend either to conflict and friction or to apathy and aloofness.

Another cause of the general lack of common interests in Montreal is the very large influx to the city of persons with purely private interests. They come from many lands each with his axe to grind, and each seeking nothing in Montreal but a grindstone suited to his needs. The rapidity with which the city has grown lately and still continues to grow further contributes to its formless and dishevelled state.

In a city of this kind then, where are we to look for hope for a better state of things—for some pride in having the city to appear well in the sight of men—in the sight of her own men and of the stranger who comes to her gates? The said stranger if he comes by water is tipped out into an unassorted lot of fragments of wharfs and grain elevators. Regretting that he should have arrived at so unfortunate a time when such extensive alterations were just at their thickest, he mounts a cab and is conducted up St. Francis Xavier or St. John street. These curious streets are unfortunately also a little out of repair and if the picturesque profusion of poles and wires were a little less thick one might be able to say whether or not these large buildings were of substantial construction. In St. James street he can recognize that the buildings are indeed substantial and tall enough to satisfy any mind not smitten with the fever of giantism. This street is unfortunately narrow—a result doubtless due to its antiquity—so, paying due reverence to age, he can admire the picturesqueness of this street with its spasmodic buildings. In Craig street one encounters the phenomenon of a fine wide thoroughfare, convenient and central, which is as yet little taken advantage of for trade or business purposes and is largely occupied by a class which exhibits a painfully low order of intelligence in disfiguring whole rows of the neatest old stone houses imaginable with disproportioned and unattractive, not to say repulsive signs, in apparently some kind of simple and unquestioning faith that they thereby recommend themselves to the general public. A little modesty and tidiness would make a wonderful transformation here.

Telegraph poles and wires we know are mortal and will pass away—we hope to live long enough to see them decently interred underground. The electric car wires give promise of a longer period of pernicious life, but to improved methods of traction these too will yield. These are accompaniments of unperfected engineering devices. They are the derricks and scaffolding required in the growth of our civilization and will be taken down when the constructed fabric comes into the full exercise of its functions with implements more efficient and more seemly. But these disfiguring signs are worse than sins, they are blunders, and to architects they are particularly offensive as being a cheap way of obliterating even the finest architecture.

What one should wish and can surely hope to see is an intelligent emulation in excellence of appearance, not in magnitude of announcement—in appropriateness and charm of expression not in loudness and piercing quality of voice. At the present day advertisement is everywhere loudly acclaimed as the one true god who will lead our endeavours to success. Let us remember then that our gods are images of ourselves and be careful how we shape our advertisements.

In the beautifying and ennobling then of this our so cosmopolitan and formless Montreal we must look to the broad sentiments which are the property of all mankind. Its diverse elements are a great potential mine of wealth. Though hard to fuse together their eventual fusion will yield the richer product. The resultant character will be broad and inclusive, made up of many of the strands that compose our human nature. Such a character we may hope some day to see expressed in the streets of our city—its buildings with grace fulfilling their functions and therefore looking appropriate thereto, and the people exhibiting manners as sane and delightful as their buildings—both equally free from the present blatant advertisement and untidy scuffling—their work a pleasure to themselves and to those who deal with them.

"CONCORDIA SALUS."

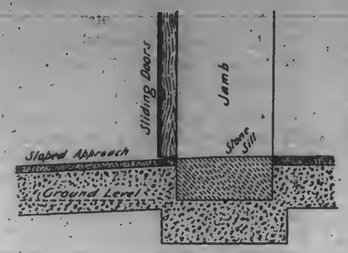
CHURCH HEATING AND VENTILATION.

Particulars are given by the Decorators' Gazette of an interesting method of church warming and ventilating introduced by a German heating engineer in a Berlin memorial church that in general plan resembles St. Paul's Cathedral in London, though of smaller dimensions, the height of the nave and transepts being 82 feet and of the dome 237 feet. The corresponding measurements of St. Paul's are 100 feet and 360 feet respectively. To the height of 80 feet from the floor the walls are traversed by hot-air chambers, so that from the ground to the galleries 22 feet above, there is no perceptible difference of temperature, the air being kept constantly at 60 degrees. The radiating surface is placed high up, in the neighborhood of cooling surfaces, maintaining a higher temperature in the upper portion of the building, and intercepting and reheating the cooled air in its descent toward the lower part occupied by the congregation. There are thus four strata of air of different temperatures. On the ground floor and in the galleries there are very few coils, but along the first entablature, at a height of 95 feet, the coils are sufficiently numerous to counteract the loss of heat through the walls, which are no longer traversed by hot-air channels, and to maintain from this level to that of the second entablature—at a height of 145 feet, or 50 feet above the first—a temperature a few degrees higher than that in the parts below. Other coils are fixed above the second entablature and in the lantern of the dome. To avoid the dangerously chilling draughts that would follow the opening of the doors in the intense cold of a Prussian winter, the entrances are provided with double swing doors and coils are placed in the intervening passage. The engineer maintains that the system of heating the upper more than the lower regions of the air is the only proper course in such lofty buildings as churches. He holds that with the ordinary method the air heated on or below the ground level is cooled in reaching the roof, and, fouled by the products of respiration, descends on the heads of the congregation, unless withdrawn by some such exhausting arrangement as is carried out in the English Houses of Parliament; while in his system the fresh air is warmed to an agreeable temperature in its passage through the walls, and its ascent is favored by the coils between the first and second entablatures. The coils in the dome, although they do not contribute to the warming of the parts occupied by the worshippers, serve effectually to prevent the descent of the foul air by securing its continued ascent toward and escape through the apertures in the lantern that crowns the edifice.—Decorators' Gazette.

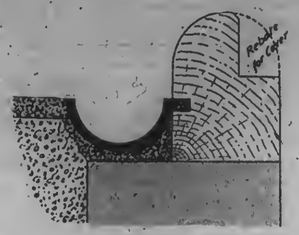
In the construction of a large factory on the site of what was formely the bed of a canal, of Cincinnati, it was found impossible to set a foundation except by driving piles. As wooden piles would rot, resort was had to concrete piles which were successfully driven home by the impact of a 4,000 lb. hammer. The top of the piles were prevented from chipping by the use of a steel bonnet. In some instances it required 400 drops of the huge hammer to sink the pile. This is said to be the first time the this method has been employed in the United States.

SOME NOTES ON MOTOR HOUSES.

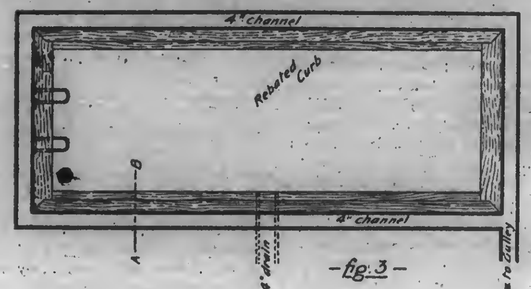
With the swift strides made in the automobile industry during the last few years the demand has arisen for a class of building unthought-of a decade ago; and there will soon be but few architects in general practice who will not at one time or another have been called upon to prepare plans and specifications for a motor house. At this early stage no settled definite planning has been arrived at; much that has been done must be looked upon as merely tentative; and I would therefore ask the reader to remember that I put nothing forward as final, preferring my remarks to be treated simply in the light of suggestions, from which (in combination with the opinions and experience of others) some settled lines may in due course be evolved.



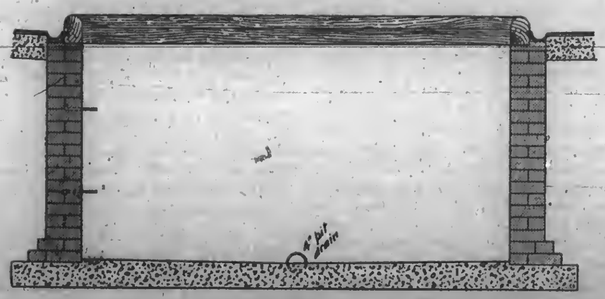
—fig. 1—



—fig. 2—



—fig. 3—



—fig. 4— Scale of Feet —

It is scarcely necessary to say that nothing of a temporary nature should be deemed good enough for the stabling of a motor car. Wood and corrugated iron buildings, whether portable or fixed, are both unsuitable for the purpose, warmth, dryness and approximate equality of temperature being of first importance in the preservation of a car. It is a poor policy to risk the well-being of a vehicle costing hundreds in order to save a few pounds on the structure in which it is to be housed, and beyond this there is the question of personal safety, which may be seriously imperilled in consequence of the rusting of parts of the machinery or the action of damp upon the fabric of outer covers and the rubber of inner tubes.

With the style of building I have no concern, that being entirely a matter for the individual architect neither am I concerned with the materials to be employed for walls and roofs so long as they are lasting and thoroughly wind, weather and damp-proof. The walls internally may be finished with struck-jointed brickwork or they may be plastered; but the best finish is of course given by some form of tiling, with a dado of enamelled bricks for the harder wear in the lower portions of the walls. Roofs should be boarded and felted and should, if possible have neither rooms nor loft above so that plenty of top light may be obtainable.

In place of the obsolete coach-house doors, steel-hinged wood revolving-shutters or sliding doors should form the entrance, as with these there is no danger of damaging the car by the swinging of a hung door in a heavy wind. The doors, if sliding, must run on an overhead track, and all framing should be inside, with flush boarding outside to throw off the wet. A paved approach laid to an easy fall leads to the stone entrance sill, which is on the level of the finished floor surface and about six inches above the level of the surrounding ground (see Fig. 1).

The chief figure which distinguishes the motor house from every other building is the planning of the floor, and it is in regard to this that great care must be exercised. Whatever the size of car to be housed, a pit must be provided for cleaning and inspection purposes, and it is advisable (though not necessary) in the case of a double motor house to have two pits, one for each car, so as to avoid the frequent changing of position which would otherwise be necessary. I will, however, confine myself to a single pit. This should be not less than 3ft. wide and 4ft. 6in. deep (see Figs. 3 and 4). Length will depend upon the size of car; but it would be as well to anticipate a little and make it, say, from 9 to 12 feet—the latter size being, in my opinion, the maximum requirement for any make of private car. The pit may be brick built with rendered faces, and with floor finished as the floor of the house, and no care or expense should be spared to render it thoroughly watertight. The drain will discharge outside over a trapped gully, with small inspection pit built up, or an ordinary syphon-pipe with extra inlet carried to ground level (to form inspection eye) may satisfy local requirements. Around the pit is laid a 7in. by 5in. hardwood curb, securely fixed to the brickwork of the walls, the curbs laid in the direction of the length of the pit being rebated to receive the movable covers (see Fig. 2). The curbing should be laid so as to be 4in. above ground level, as otherwise (i.e., with a flush or nearly flush curb) there is a danger of the car mounting the curb and sustaining serious damage by a fall into the pit. Pit-covers are best made in small light sections, so as to be easily moved, and they must be strongly framed (to take the weight of the heaviest car) and provided with flush handles for lifting. Personally, I do not see the need for a cover at all; but owners seem to like them, and after all it is a matter of small moment. Step irons should be built into the brickwork of the pit for access purposes.

The floor itself may be formed of any non-slippery, impervious and hard-wearing material—asphalt or tiles for preference. Around the pit a 4in. glazed stoneware channel is laid flush with the floor and butting against the wood curbs (Fig. 2), and the floor is best made to fall in every direction to these channel pipes, which discharge eventually in the open over a trapped gulley. With raised kerb and the channels no trouble can arise from water finding its way into the pit.

Lighting and heating are matters which require more or less special consideration in each case. I have mentioned the importance of plenty of light; in fact, the simplest way is to "pier" the walls and fill in with solid frames and casements, having small top lights to open for ventilation in addition to the casement sashes themselves, which may all be stayed open in favorable weather. The roof-lantern will afford constant ventilation in practically all weathers. Heating is a necessity, whether by hot-water pipes, radiators or open fires—the selection being left to the judgment of the architect, upon a consideration of the most suitable system. The life of a car (and especially of its working parts) is very much prolonged by housing it in a warm, dry, equable atmosphere. Artificial lighting is another matter which must be regulated by local facilities; to discuss it here would be a waste of space.

Lavatory and water-closet should both be provided, together with a wardrobe for motor garments, rugs, etc., and a drying-room—fitted with pegs, battens and slatted shelves—for the reception of the same after a wet run. The drying-room will need to be well ventilated for the escape of moisture, the heating arrangements depending upon those adopted for heating the motor house. A small workshop is a very handy thing to have in connection with the house; but where expense precludes the provision of this a bench (fitted with vice, &c.) should be fixed in one corner of the house, and racks provided with tools, spanners, wrenches, &c. Wooden harness pegs are eminently adapted for spare covers, and a row of these should be placed in some convenient position. Water must, of course, be laid on, and it is a wise plan to have the taps fitted with unions for hose connection. Petrol is best stored with other oils in a separate building (of however rough a nature), detached if possible.

As to the size of the motor house itself, this will again naturally depend upon the size of the car, but ample room must be left to get round on all sides. Excluding the space required for bench, cupboard, lavatory, &c., a safe size for a small car is 10ft. by 14ft., and from this one may go, in the case of larger cars, up to 14ft. by 20ft. It is the biggest mistake in the world to cramp the building, as an extra foot or two by no means entails a proportionate initial cost, whereas structural alterations for the accommodation of a larger car may mean a heavy expenditure.—B. WYAND in London Builders' Journal.

CHAINS USED IN BUILDINC CONSTRUCTION.

St. Paul's Cathedral, with its celebrated dome, higher outside than inside, was completed by Sir Christopher Wren about two hundred years ago, and he put an iron chain round the base of the cone. The construction of the wooden external dome, the support of the stone lantern by an inner cone of brick-work, quite independent of either the external or internal dome, are wonderful examples of Wren's constructive ingenuity.

In the "Parentalia," written by Wren's grandson Stephen, partly in his own words, partly in those of his grandfather, is this passage: "Although the dome wants not butment, yet for greater caution it is hooped with iron in this manner; a channel is cut in the bandage of Portland stone, in which is a double chain of iron strongly linked together at every 10 ft., and the whole channel filled up with lead."

DESIGN AND CRAFTSMANSHIP.

Ever since the ideas of mankind had to be converted into concrete form, there has existed a gulf more or less wide to bridge over, and even in this twentieth century, with all its arts and appliances, we are still scarcely able to reconcile design and construction. The exhibition of selected works from the various national schools of art we noticed last week shows to what an extent this discordance is still observable. The examiners in their several reports speak with much reserve and caution of works in different branches which indicate this separation. Though in many instances the drawings or designs reach the standard required, the executed specimens sent in show a falling-off; the designers' ideas have not been realized in some important quality. In not a few cases the subjects attempted are beyond the students' capacity or powers as with regard to the architectural designs. In many more the design has been made in complete ignorance or forgetfulness of the actual condition and limitations of the material; and directly the student passes the barrier, puts his ideas into execution, he finds a great deal of the beauty and glamour of the conception disappear. These qualities seem to elude his grasp, and in their place we get the hard and intractable qualities of stone, wood, or iron, the want of precision and definition inseparable from moulded and cast materials, and machine tools, the inequalities of form and colour caused by firing in pottery and tiles, and the technical defects inherent in textile and woven fabrics. A decorative design may look admirable on paper; but when it comes to be translated into the real material, by stenciling or brushwork, by the arrangement of tiles or tesserae or thread, the effect may have been considerably diminished. We notice these defects in most of the stencilled work we see executed, in tile decoration, where the painting and pattern are at variance, and in woven textiles where the technique of weaving is not understood. In furniture, wood inlays for panels, we observe a distinct inferiority in the executed work if the designer has not selected the proper-coloured wood for inlay, or placed them according to their grain to suggest the nature of the object presented. In the very artistic firescreen we noticed last week by a student of the West Ham School for which a gold medal is given, the designer has observed these points, he has selected suitable coloured woods for the figures representing the four seasons, and the grain and "figure" of these woods are made to suggest the drapery or vestments, the hair, even the growth of trees in the background. The designs on paper are sometimes at fault: they show or expect too much; they suggest ornament and treatments which cannot be realized in the particular material; they are frequently overcrowded with ornament. On the other hand, the designer may know little of the material he uses or the method of construction; his selection of material to represent his design may be imperfect, or his method of application faulty. Owing to one or the other of these errors, or both, the execution fails. One sometimes sees a design that is really defective and faulty in itself, yet which by the skill of the workman or artist engaged in execution is produced in a very satisfactory manner. This result is because the craftsman has discerned the designer's intentions, and has put forth his own personal skill in the execution. It is the way in which the success and charm of a good deal of Mediaeval building and detail can be explained. Both designer and craftsman devoted their heart and soul to the work: they put into it their best efforts, and what one failed to do the other rectified or perfected. But under our modern system of workmanship we have no such corrective: the designer does not co-operate with the executive artist—there is little sympathy between them, and so the inferior design is misinterpreted or aggravated in the result. The craftsman obtains no personal interest in the work or extra pay for endeavouring to improve the design or offering suggestions. Why should he trouble to do more than follow the drawing when he reaps no reward for his skill? So the modern estrangement between the work of designer and craftsman is detrimental. On the other side, the design may be all that can be desired; but it is placed in the hands of workmen or artists who are imperfectly educated in art, and who do their work in a mechanical way. This is, perhaps, the commoner failing; it is the one which the architect who carries out contract work so often experiences. His ideas and intentions are thoroughly misunderstood or evaded, with the object of cheapening cost. Such things occur as details altered or cut down, mouldings misunderstood or altered, depth of relief diminished, the ornament mutilated—in short, the design really "murdered." Whichever may be in fault—the design or the material and method employed—the result is disastrous for art. The two things must go together. Design and construction or handicrafts engaged must be linked together, as any disagreement or difference is fatal to both. We may have good construction without skilful design. Thus we may have a building perfect in every trade, and scientific in its construction; but from error in planning or a discord in the external design it never satisfies. Or we may have the reverse—perfect design linked to a building that is badly constructed, and is always showing signs of weakness and decay. Neither is desirable. The Schools of Art combined with technical instruction have attempted to bridge the chasm—to unite both the artist with the industrial producer. We do not deny a good deal has been done in this direction. Artists and designers have been brought into touch with manufacturers. We have now much better and more satisfactory metalwork, woodwork designs, furniture, pottery and porcelain, stained glass, modelled work, wallpapers, hangings, carpets, and textile goods, and the training in art has influenced our industries all round; but still there is the distinct and separate training given to each. The designer is still taught to furnish designs based on traditional methods apart from materials and methods of construction, and the craftsman is taught little of the art or methods employed, and is satisfied if he can turn out so much work in a certain time. Other causes have kept the two apart.

The divergence between design and construction or execution is greater under some conditions. Where the artist designs in only one material, the difference is less than it would be if several materials are employed. Thus designs for modelled work are more likely to honestly express the actual result; but when several materials have to be taken into account in the construction, there is the likelihood that the design cannot express equally well in each the actual want. A work of architecture comes under this category. A building is constructed of various materials; brick, terracotta, stone, timber, iron, plaster, &c. It is almost unreasonable to expect the architect to be expert as a designer in each. If he can express his intentions artistically in brick or stone, we may excuse his faulty details in materials like iron or wood or plaster. The result is that in building the power or ability to design is much more rare; it requires more extended study of materials and trades than the designer in wood or metal, or any other single material. The artist in one material soon acquires a manipulative power over it: he knows its structure and physical peculiarities, and he soon acquires the skill to handle it and to bring out its technical and artistic qualities. Thus in modelled design, in metal or repoussee-work, in tilework and pottery, the results are more satisfactory: a shorter study is necessary in mastering the technical methods, and the designer, in short, is able to express his ideas more directly in the material. So the designer and worker in modelled work or metalwork or carving ought to be the same individual; in the old days they were always so, and it is almost impossible to imagine a designer of sculpture or carving who was not also the sculptor or carver. So in other art-crafts where only one material is employed, like those of wood, or metal or plaster. The most satisfactory results are derived when the two functions of designer and handicraftsman are united. The students' work done in the London County Council Central School of Arts and Crafts is an effort in this direction, the aim being to supply those engaged in artistic handicrafts, training in design and manipulation which is now impossible owing to the subdivision of labour and modern mechanical processes. The modern workshop has not yet assisted in this direction, though to it we must look for new spirit and energy. In architecture the relations between design and craftmanship are more complex. Several materials have to produce the result, requiring a band of trained craftsmen under one head. And the more composite the building is, the greater is the effort required for a satisfactory result. Thus in buildings in which the effect is largely due to one material, say, stone or brick, more unity and harmony of effect is attainable than in a structure composed of various materials, each having its own limitations and methods of execution. Thus it is that in the designs contributed for buildings there is a larger number of failures than for designs in one material. In this connection the question of the architect being capable of executing his own designs (if possible) comes in. There are many who protest, and of course, the "professional" architect is chiefly averse to such an idea. It is, of course, nowadays at least, quite impossible to imagine any such a union as architect and craftsman, although it is obvious it is all the better for the designer to have an acquaintance with the conditions and limitations of the work he is designing. But, as we have hinted, he would have to be a craftsman in each of the materials employed in a building—an impossible thing nowadays at least. Imagine a Scott, a Street, or an Aston Webb so engaged. As Mr. Walter Crane has put it, an architect would not be able to pay his rent and taxes if he did so; yet, he observes, with some force, "If a designer does not realize the conditions of his design and the nature of the method, and the materials by which it is to be carried out, he cannot practically design at all." We will not discuss the point now, or how far such a combination as an architect and craftsman is possible; but it will be admitted that designers have imparted some freshness into crafts that had sunk deep into trade ruts. It may be an ideal, but not a practical mode of working. Designers of buildings and decorators must now intrust a great deal of their work to trained assistants—such, for example, as the repetition of a pattern like a scroll or ornament, or the details of woodwork or ironwork. It would be wasteful of his time and energy for an architect to have to execute or even supervise every detail of a building. The workshop system is one way by which the difficulty can be solved—that is, a designer co-operating with assistants or craftsmen whom he can train and inspire, and from which band of workers others may learn the craft. As one writer says, every designer should be able to take up the craft for which he is best adapted. There are some crafts which depend more on individual expression (as those of one material) than others. These are best in the hands of men who can design as well as execute in them.

Our leading artists and designers now look to the workshop and the studio as the main sources of inspiration. Mr. Ashbee has remarked that art must be carried on in the workshop and not in the studio, and he draws a graphic picture between the workshop and the studio. The latter is described as a "Happily situated nest somewhere in the region of villas and top hats; it is fitted with all apparatus for the lighting, lifting, and wheeling to and from exhibitions of the large masterpiece, and it is ornamented with all the conventional gusto of the prevalent Queen-Anne-ity. Within these are scraps of damask silk, bartered from Roman curiosity-shops, divers subjects under way, various Madonnas of the future, suggestions of decorative work sprayed upon the odd moments of panels. There is a cast from studies, a photogramme of Millet, a skeleton, and a lay figure. In the corner a pair of embroidered slippers. . . . The inmate for whom these things have their being works hard, appreciates the solitude and silence of his surroundings, and is comfortably conscious of his Bohemianism. In the afternoon there are lady visitors, and his servant brings in five-o'clock tea." The workshop is almost as light as the studio, though less pleasantly situated, and near the racket of some big thoroughfare. But what matters noise? There is noise within—hammering and sawing and what not. Nor are the internal surroundings as pleasant to look on. Blue whitewash takes the place of damask fragments, and movable gas-jets of patent reflectors. The place is in a condition in which no housewife would enter it, and the gluepot is simmering on the stovepipe. As to the fittings, there are benches and racks for the tools and a good deal of grime. To hang up prints would be inadvisable . . . . The inmates of the workshop pursue their avocation with the regularity of clockwork; a light in their faces, perhaps of an armed resistance to something—and the dinner-hour at twelve o'clock is enlivened with the perusal and discussion of racy paragraphs from the half-penny radical prints. These are the two pictures; but I hold that in the higher sense the proper place of decorative art is the latter." And the same writer goes on to say: "In the first place, the right understanding of forms of ornament—elements of design—is only possible in their direct bearing on forms of material—elements of construction. You need your basis of matter wherein to engender the spirit. You must understand the stone, the wood, the pigments, the clay; what each can do, what its limitations are; and this means an understanding—if merely for the sake of conceiving our

own incapacity to use them—of the tools that are the guardians of these limitations. 'Rivington's,' that famous tome of building construction, whose pyramidal ascent of facts has to be scaled before youthful architects pass Royal Institute examinations, would lose half its value if it were not for the fact of the isolation of the architect's studio, euphemistically termed his office; but a half-hour in the workshop would save days of fruitless drudgery over its pages." As he says, every hour in the workshop reveals something, or we may go to our studios and copy realistically; but, given the knack, it always remains easier to copy realistically than to master the limitations of material. It is true also that ideas may be conceived in solitude, but they are brought to birth by co-operation. By coming together creativeness is engendered by the very magnetic affinities that spring up between men.

Academies and exhibitions—the agencies of modern times—have had a blighting influence on practical art by encouraging the sensational and unreal. In the old days, the artists of the Italian, German, and Flemish schools produced handicrafts in abundance. As Mr. Yeames, R.A., said some time ago, referring to the drawbacks to art arising from competitions and exhibitions: "Then the artist kept a shop, and priest or noble who wished his church or palace decorated went to his shop, and, if satisfied with his skill and pleased with his designs, commissioned him to decorate a chapel in his church or a portion of his palace. The artist's thought was then to bring his work—whether fresco or carved marble, whether Scriptural subject or fountain with Venus and Tritons—well into harmony with the surroundings of the place which it was henceforth to occupy, and to make it express not only his own fancies and views on art, but also the feelings and character of the man who gave him the order." Nothing sensational was attempted; there was a community of thought between the designer, the patron, and the craftsman. All concerned worked in unison: there was a harmony between building and ornament, between sculpture and painting, between furniture and vestments. The point chiefly to notice is that exhibitions encourage and foster the unreal and tricky effects of art and draughtmanship, to the detriment of workmanship, material, and texture. In this manner they discourage the practical side of art work. The only corrective to this unreal quality of design is to look at it from the workshop point of view. Under such a system there would be a living tradition in design and workmanship. To the separation of brains and hands we must attribute the present paralysis of art. No one can be so unreasonable as to suppose that there must be no subdivision of labour: the workshop system assumes such a system where designers and craftsmen can learn each from the other, and where there is a helpful co-operation in the carrying out of a building or a piece of decoration. Technical schools are doing something to train designers to execute their own designs in at least some materials.—The Building News.

The joint weekly luncheons of the Toronto Chapter of the Ontario Association of Architects and of the Toronto Eegineers' Club have been resumed. They are held in the rooms of the Societies, 94 King Street West, every Tuesday at one o'clock. A cordial invitation is extended to all engineers and architects to attend.

ARCHITECTURAL CLASSES.

The Mathematical Classes for architectural students conducted by Mr. A. H. Harkness, B.A., last autumn and winter, were resumed in the rooms of the Ontario Association of Architects, 96 King Street west, Toronto, on the evening of Monday, October 10th. Arrangements are being made for a continuance of the studio classes, but announcement has not yet been made of the date on which they will be resumed. These classes as heretofore will be conducted under the auspices of the joint committee of The Ontario Association of Architects and the Toronto Architectural Eighteen Club. The usual fee of $5.00 covering tuition in both courses will be charged. An invitation is extended to all architectural students and draughtsmen to join.

COLOGNE CATHEDRAL.

The present site of one of the finest specimens of gothic architecture in Europe was formerly occupied by a cathedral commenced by Hildebrand, Metropolitan of Cologne, early in the ninth century. Some years later, in common with other churches on the lower Rhine, it was practically demolished by the Normans, and was rebuilt under Williebert, and after twice escaping destruction by fire in the eleventh and twelfth centuries was burnt down in a great conflagration which occurred in 1248.

Soon afterwards the present cathedral was commenced by Conrad of Hochstaden, the design being attributed to Gerhard von Rile, and by 1322 the choir was completed and consecrated. Subsequently the work preceeded but slowly, especially after Conrad's death. At the time of the Reformation the work was suspended, and after passing through various vicissitudes, the repairing of the Cathedral was taken in hand early in the nineteenth century, and the building of such portions necessary for the completion of the whole structure.

The Cathedral is cruciform in plan, and is composed of a nave flanked by double aisles, and transept with single aisles; the outer aisles terminate at the choir, which is surrounded by numerous chapels. The many richly coloured windows add greatly to the imposing effect of the interior.

NOTES.

Experiments have recently been made in Germany to determine the cohesive power of clay, and, if possible, to increase this power in the natural material. Samples of clay mixed with a two per cent. solution of starch, dextrin and tannic acid were stored for six months side by side with samples mixed only with water. The tensile strength was determined in each case after three week's storage and again at the end of six months. Taking the ordinary tensile strength as one, that of the wet clay was found, after three week's storage, to be 1.35, and after six month's storage to be 1.39. Starch and dextrin did not appreciably increase the tensile strength, but tannic acid gave most satisfactory results, showing the tensile strength during the first three weeks to be 1.75 and at the end of six months 3.22.

Two Canadian patents for fireproof construction have recently been granted. The main feature of one is a network of wires or rods, fastened with hooks to supporting beams, and covered with a reticulated material; concrete is then placed on top of the beams, rods and this material, and above that are placed alternate layers of felt paper and insulating material, and the floor is laid on top of them. The other patent consists of a fireproof tower containing ventilating shafts, in connection with a system of water-pipes arranged in the ventilating shafts and within recesses in the floor of the building. Other inventions are a device for removing shingles and a tiled flooring.

NORTHWEST NOTES

Branch Office of THE CANADIAN ARCHITECT AND BUILDER,
720-721 Union Bank Building, WINNIPEG, October 14, 1904.

The unchangeable wet weather of the past month has greatly hindered the work of finishing buildings in the city and all classes of work are behind hand in consequence. As the cold weather is approaching, contractors are doing their utmost to complete the many buildings on hand, and every endeavor is being made to get all outside work finished before the winter sets in.

Last fall quite a number of buildings were continued far into the winter, but the expense of supplying the necessary heat when bricks and mortar have to be kept hot to prevent them from freezing, and the additional time required for work on account of the intense cold makes it almost a prohibitory proceeding. We understand, however, that rather than carry some of the buildings under progress over until next spring, that they will be continued through the winter, providing sufficient materials are to hand. This in the winter is very difficult to provide for. Here again the question of transportatioo comes in, as freight moves more slowly in winter than in summer.

There are quite a number of interesting structures under construction. The new Free Press building on Portage avenue and Garry street is well advanced and about ready for roofing. It is of steel frame construction with concrete floors and consists of four stories and a basement. The frontage is 42 feet on Portage avenue by 150 feet on Garry street. The outside is of Tyndall stone to the ground floor, Lac du-Bonnett pressed brick and stone trimmings for the upper stories, finishing with a copper cornice. The building is to be of the most modern fire-resisting construction, having iron and slate stairs. The interior is finished in oak on the ground floor and in ash above. It is equipped with the Wabash system of heating and is supplied with its own electric plant for lighting, operating the presses, etc. It will be the most up-to-date newspaper building in the Dominion, having some 40,000 square feet of area. The cost will be about $175,000. Mr. H. Stone, of Montreal and Winnipeg, is the architect. Messrs. H. R. Ives & Co., of Montreal, have the contract for the iron stairs.

The Manitoba Club is another fine building, on which work will be continued throughout the winter with the object of reaching completion in the spring. It occupies a very suitable position on the corner of Broadway and Fort streets. The plans show two wings, but at present the east wing will be omitted and added in the future. The building is being constructed of red sand mould brick and Bedford limestone and will have a frontage of 96 feet on Broadway and 82 feet on Fort street. The first and second stories are for club purposes and the attic and basement for attendants' quarters. Separate suites of rooms will be provided in which the ladies can give private parties. For these there will also be a private entrance. There will be a large lawn at the rear of the block on the south side. This again is adjacent to the old Fort Garry Park, where the old fort gate is keep in good repair as a memento of by-gone days; so that the Club House will always have a large open space at the rear. The building alone will cost $80,000; it is to be richly finished and decorated. T. F. & W. A. Peters are the architects.

Another large building that is nearing completion for the present is the warehouse of Messrs. Teese & Peerse. I say "for the present" as it is the intention to put an addition to it next year. The portion now being finished is 60 x 66 ft., five storeys and basement, but when the whole building is completed it will be 240 ft. long by 66 ft. wide. It is of mill construction and designed to carry 600 lbs. to the square foot, live load. All windows are fire-proof, made of galvanized iron and wire glass. It has a private siding, being built on the C.P.R. track at the corner of Princess street. The present work will cost about $25,000 and after the addition is built it will cost about $100,000. H. Stone, of Montreal and Winnipeg, is the architect, Plaxton & Co. are doing the heating, Cotter Bros. the plumbing and J. A. Payne the painting, all of Winnipeg.

J. H. Hough is building a large warehouse on Princess street which will be occupied by the Alaska Feather and Down Co., Limited. It will be 66 x 117 ft., 3 storeys high with basement, with two additional storeys to be added later, and will cost about $25,000. Darling, Pearson & Over, of Toronto and Winnipeg, are the architects.

Darling, Pearson & Over are also the architects for the new Post-office to be built on Portage Avenue next to the Free Press building. It will be one of the finest buildings in the city. Tenders are to be in by October 17th, but only the foundation will be done this fall.

Several other large blocks will soon be occupied by the tenants. Bullman Bros'. seven-storey building on the corner of Bannatyne Ave. and Albert St. will be occupied as offices.

Another large stone and brick block 130 x 44 ft. is almost completed. It is on Portage Ave., is three storeys and arranged for stores and offices.

The Macdonald & Wright Block, also on Portage Ave., is about ready for the tenants. It is built of local brick and stone and is three stories; also intended for stores, offices and residences.

Messrs. A. Carruthers, Bros & Co. are just completing their building on Logan Ave.; it is 125 x 66 ft. and has three floors.

H. S. Wilson has a large block 105 x 45 ft. on the corner of McDermott Ave. and Albert St. almost finished. It also is for stores and offices.

There are numerous other large business blocks that are being finished of which mention may be made later.

The past season has seen considerable progress in the direction of providing apartment blocks for Winnipeg, something that was very much needed. Although quite a number are being built still the demand has not been met as is evident by the large number of applications for suites of rooms, in spite of the fact that rents are very high. A very substantial apartment block built of brick and stone on Cumberland Ave. will soon be ready for occupation. It is very well arranged in three floors, steam heated, electric light and every modern convenience. Each floor has two suites complete in every detail. Another block of a similar class is being built on Notre Dame Ave., also a large one three stories high on Fort St., one on Main St. in the north part of the city, and another just commenced on Smith St. near Portage Ave.. One would think the demand for offices and apartments would be well supplied by the end of this year, yet one builder tells me he has had at least forty applications for a suite of rooms in his block and it only contains four suites.

Up to the present time there have been 1,552 building permits issued, covering 2,017 buildings, at an aggregate cost of $8,536,700. This is $3,300,450 above the amount of last year up to the same date. Winnipeg has something to be proud of in the fact that no other city on the continent can reach her in this years building valuation. New York comes second and Chicago a poor third while others follow on down the list.

Since writing these notes we regret to say that Bullman Bros.' fine new block previously mentioned has been completely burned, also J. H. Ashdown's large retail store, just opposite, which had recently undergone considerable alterations and improvements, was completely gutted.

We regret to say that Mr. V. W. Horwood, architect, whose plans were accepted for the Public school at Fort William, is in Winnipeg hospital very low with typhoid. His brother, E. L. Horwood, architect, of Ottawa, is attending to the detail plans.

A large block 132 x 130 feet is being commenced on the south-east corner of Portage avenue and Donald street, just opposite the T. Eaton block. Mr. J. A. M. Aikens is having it built and will fit it up to suit tenants. Mr. Woodman is the architect.

The Dominion Express Company's new stables on Alexander avenue east, have just been opened. They are of modern fire-resisting construction. The present capacity is for 25 horses and rigs. Mr. Woodman is also the architect for this building.

Sproats, Rolph & Chrysler are the architects for C. H. Campbell's new house. The tenders were let for $18,500.

The large addition to the Winnipeg Electric Street Railway will soon be completed; further particulars of which will be mentioned later.

The C.P.R. subway will be ready for opening by November 1st and next month we may be able to give a description of the work. The new station, offices, Immigration buildings, etc., are making rapid progress and are being rushed as rapidly as possible, as the present state of things causes great inconvenience to all concerned.

The Canadian Northern Railway are also building a new station at Carberry. It will be up-to-date and will cost about $6,000. Mr. N. H. Fraser, contractor, has the work in hand.

Summing up the situation in the building trade we find all the contractors in a fairly satisfactory condition regarding the buildings they have on hand. Here and there a building has been delayed for want of material, and bad weather has hindered building. Unusual quantities of rain have in cases caused trouble with the excavating and the foundation work, but on the whole nearly all buildings will be in good shape when winter sets in. Inside finishing work can thus be done during the winter. The towns throughout the province are in the same condition; all building is well in hand for the winter.

To say that the contractors have had a busy season is putting it mildly, as most of them have had so much on hand that they hardly know what to do first. Architects are very well satisfied and have plenty of work ahead of them to get into shape for next spring.

DIFFICULTIES AND METHODS OF PLASTERING IN WINTER.

Plastering in winter is always attended with more or less unsatisfactory results. The walls possibly do not become hard or they are disfigured by yellow stains or smoked a dark gray color from the fires used to keep the house warm, or there is an unusual amount of cracking; the white or finish coat rubs off like whitewash or most of the plaster peels from the walls, requiring it to be entirely replaced. These and many other defects are due to very simple causes, which with little care can be easily remedied. So little attention has been paid to the question that the causes of the ill results in winter plastering are little understood.

Heretofore wall plaster has been a mixture of varying proportions of slaked lime, sand and hair made at the building, usually out in the open with no protection from the elements. If cold weather came on the mixture would freeze and could not be used until thawed out, with consequent injury to the binding qualities of the material; or, as often happens, the frozen mixture is applied to the walls to soon come off as the frost thaws out. Then, too, the quality of lime used varies greatly, and poor lime is cheap. Sand also differs greatly in quality, and sand that contains a large percentage of loam requires less time to bind it together; but loamy sand makes a very inferior plastering mortar. When lime of the best quality is obtained and good sharp sand is at hand, the proportions that enter into the mixture are uncertain and are guessed at by the laborer who does the mixing. This laborer is the unskilled workman of the job, and if he does not properly manufactnre the mortar all the skill in the world in applying it to the wall by skilled workmen will avail little.

This unsatisfactory state of affairs in making plastering mortar has now been overcome, as many manufacturing plants have been established throughout the country which slake lime by machinery, dry the sand, card the hair, automatically weigh the proper proportions of each and mix the whole together thoroughly by machinery and deliver this mixture in a dry state to the building in suitable containers, usually jute bags. As the material so prepared requires only water to be added at the building to make it ready for use it does away with a great many of the disadvantages of the old way, and has the great advantage of insuring a uniform plastering mortar of very superior quality that is easily handled.

Plastering mortars prepared in this way can be taken into the building and mixed with water in water-tight boxes on the floor where it is to be used, and this avoids all chance of freezing if the building is properly heated, as it should be.

In the treatment of some of the troubles encountered in plastering in winter, we will not consider those met with when plastering mortar is made at the building in the open in the old way, but will consider that if the mortar is made at the building that it is properly protected as far as its manufacture is concerned. With this exception the following comments apply equally to all kinds of plastering mortar.

Plaster is necessarily applied in a wet state and the surplus water has to evaporate or be dried out of it. It is this surplus water and other dampness in a new building that are the chief causes of trouble in winter plastering.

The amount of dampness in a building is very much greater than is usually supposed. In frame structures there is moisture in pretty much everything that enters into it, the brick in the chimneys, the cement concrete in the cellar and bath rooms, even the lumber contains much moisture. In the larger brick or stone buildings with thick walls, concrete or tile floors the amount of moisture is very great. The greater part of this moisture will have to be dried out of the building sooner or later, but until this is done it is liable to be a source of trouble, and this is particularly the case in winter.

The methods used to get rid of this moisture are for the most part crude, and in many cases are the causes of greater trouble than the moisture itself. In hardening, the plaster of paris and lime in wallplaster combine chemically with some of the water, either in the form of water of cystalization or in formation of hydrates. Therefore, all of the water added to wet the plaster does not have to dry out. The so-called hard or patent plasters all contain more or less plaster of paris, they do not require as much water to be dried out as other plasters that do not contain plaster of paris; in other words they dry quicker. This chemical change or hydration takes place gradually, and it is not desirable to dry the plaster so quickly as to prevent its taking place properly. An overheated building is quite if not more injurious than an underheated one. The majority of builders regard the ideal drying conditions in winter an overheated tightly closed building withnn circulation. This is far from being right. Circulation of air is, if anything, more important than heat, if the outside atmosphere is above freezing. On such days as the atmosphere outside is very damp and moist, it is better not to open the windows.

The ideal condition is to have a gentle heat to keep the atmosphere warm, and allow sufficient circulation of air to absorb and carry off the moisture. It is especially important that the heat should be kept up during the night. The proper way to accomplish this is to have the heating apparatus installed in a building and in working order before any plaster is applied. Temporary connections can be made and heaters placed in the middle of the room. By doing this and observing the simple precaution of opening the windows from the top during the day time to allow a free circulation of air to let the moisture out, the greater part of the troubles of winter plastering would disappear. No time is gained by not doing this, and it is a mistake to think that a building can be plastered quicker by starting the work before the building is properly heated. On the contrary it is much quicker to delay starting the plastering until the heating apparatus is in working order, as the plaster dries out within a few days' time in this case, whereas it is liable to be weeks and months when this is not done.

With a temperature sufficiently high to evaporate the moisture, the plaster dries quickly, and the rest of the work can follow at once, but the usual method is not to wait until the heating apparatus is in order, but to enclose the building with muslin screens and use stoves, salamanders or open fires to dry out the building. Usually the fires are not kept going at night, and in consequence the building (which has probably been overheated in the day time, as is always the case of the ceilings in the rooms in which the stoves or salamanders are placed), is allowed to become cold at night. The chances are, too, that no precaution has been taken during the daytime to permit a draught of air to circulate through the rooms to carry off the moisture. What is the result? The heat of the day vaporizes the moisture and the cold of the night, after the fires are out, again condenses it and it settles on the plastered walls and is absorbed, or if the temperature is very low the moisture freezes on the face of the plaster, which is found covered with ice the next morning. In many cases this process of heating by day and cooling by night is kept up for weeks, with the moisture for the greater part still in the building at the end of that time, or possibly a sufficient amount of it has been gotten out to make the plaster appear sufficiently hard to finish, and the finish coat is applied. Each coat should be thoroughly dry before the next coat is applied.

After applying the finish coat of plaster all moisture from the under coats has to dry through the finish coat, and as the finish coat is denser and more compact than the under coats it takes very much longer for the latter to become dry after the finish coat has been applied than if this drying had taken place before the application of the last coat. The results are usually as follows:

1. The Effect of Dampness Remaining in Plaster.—The most serious effect of plaster remaining damp and soggy and not drying out in proper time is to cause it to lose its set or strength, and in consequence it does not become hard. In other words the result is the same as if the plaster has been retempered. It is a well known fact that with plasters or Portland cements when they are retempered their strength is lost.

As time goes by, therefore, the plaster that has been allowed to remain wet and soggy dries out, but it is very apt to fall from the wall or crumble away like so much sand.

2. Staining Due to Dampness.—The scratch and browning coats of plaster should be perfectly dry before the finish coat is applied. If the finish coat is applied before the scratch and browning coats are dry, any staining from the wood lath (sap) or from brick or terra cotta walls will be carried by the dampness through to the surface of the finish coat, leaving a discoloration or stain. All moisture in the scratch and browning coats, and for that matter in the brick walls as well, dries out through the finish coat, with the result that the latter remains damp until all this moisture has entirely dried out. This seriously injures the finish coat and it is liable to remain soft. In large office buildings where the walls are massive, the dampness remains in the plaster for a long time, and beads of water are frequently seen standing on its surface. In case of brick walls when the water evaporates it leaves long, fine crystals of substances that have been brought to the surface in solution. Usually these substances are crystals of carbonate of soda, chloride of soda or other soluble salts. The use of damp-proof paints on brick or terra cotta walls, before plaster is applied, prevents much dampness coming through the plaster and should be used whenever possible.

3. Effect of Frost on Scratch and Browning Coats of Plaster.—The general effect of frost on plaster is to seriously injure its binding qualities or strength. The plaster becomes soft and does not set hard, and the plastered wall that has been frozen, is liable to fall. If the frost has gotten into the first or scratch coat of plaster and causes it to lose its strength, it will not be strong enough to hold up the two succeeding coats (browning and finish), even though no frost has gotten into these last two coats; but should the scratch coat not be injured to such an extent as to cause it to fall, the frost will thaw out and in this process push off the browning and finish coats.

It is not an uncommon thing to see the browning coat separate from the scratch coat in large sheets where frost has affected the latter. In like manner, if frost gets into the second or browning coat, this will be damaged, as in the case of the scratch coat, and if the third or finish coat is applied while frost is still in the browning coat, the finish will be pushed off in sheets when the frost thaws out, just as was the case of frost in the scratch coat.

4. Effect of Frost on the Finish Coat of Plaster.—Frost causes the finish coat of plaster to become soft and chalky and without strength or hardness. The finishing coat rubs off like whitewash and is a constant source of annoyance to the occupants of the house.

5. Plaster Appears Dry.—Scratch and browning coats of plaster appear to be dry on the surface when, in reality, underneath the surface they are still wet. This appearance is often misleading and the finish coat is applied too soon, with the result of having the finish coat remain damp until all the moisture has dried out from the under coats. As the finish coat is less porous than the scratch or browning coats, it naturally takes longer for a wall to dry that has had the finish coat aplied while the under coats are still wet, than if the moisture in the under coats were allowed to dry out before applying the finish coat. This dampness in plaster is the cause of the disfigurement of decorations.

6. Staining and Cracking Due to Use of Salamanders and Coke Pots.—The sulphur and smoke from the coke or coal used in the salamander disfigure plaster. The smoke blackens the wall, but the sulphur of the coke unites with the lime in the finish of the plaster and forms sulphide of lime, which is yellow. These are the yellow spots or blotches that appear so often on the surface of plaster that has been applied in winter time. As the sulphur only units with lime when it is damp, these yellow stains appear in round spots, the moisture drying out in small circles, just as if water were dropped on blotting paper and were allowed to dry. These small damp spots absorb the sulphur of the coke and cause an unsightly wall. The small furnace used by the plumber also adds to this yellow staining. Coke pots, when placed to near the recently plastered wall, are apt to dry it too quickly, and, in consequence, draw the wood lath, causing the lath to twist or buckle and the plaster to crack.

7. Decorating on Plaster that is not Thoroughly Dry.—When plaster is damp, as shown above, the lime which is a constituent of the finish coat of all plasters (there is no exception to this rule) acts as a bleaching agent. Paper applied on damp plaster, therefore, will fade or discolor, and paint or kalsomine will be similarly affected. Naturally the more delicate the tints of paper or kalsomine the more liable they are to be affected. Often rooms are repapered and repainted, and even the second application of paper or paint is spoiled. If the dampness in the wall is excessive, the paint is pushed off from the plaster and peels off in spots several inches in diameter.

Walls should be thoroughly dried before they are decorated and this takes time. If proper care has been taken in heating the building when the plaster was being applied, and this heat has been kept up until the trim is on and the walls are hard and dry, there is no reason why with proper precaution the walls cannot be decorated. Paint is very much less affected than kalsomine or paper. Delicate shades of either are more liable to damage, but if the walls are properly sized they can be decorated with satisfactory results. If very expensive decorations are to be made directly on the surface of the plastered walls it is best to allow the walls to become seasoned for at least one year. When decorations are on canvas or if burlap is used instead of wall paper little trouble is experienced. The trouble lies in the mistake that plaster that is hard and does not feel wet to the touch is considered by most persons to be dry, but this is far from the truth.

As poor drying conditions in winter are the cause of the troubles of plastering in winter, replace them with proper drying conditions and there will be no trouble. This can be easily brought about by observing the following simple precautions:

First, a building should be well enclosed. Nothing is gained in time by starting plastering before a building is properly ready to be plastered.

Second, a building should be well heated by furnace, steam or hot water heat. Salamanders, coke pots, stoves or open fires should not be used. They are not necessary and their use does not hasten the work. If, however, they are used their bad effects can be materially lessened if care be taken in their use. In case of coke pots or salamanders have them lighted out of doors, so that the first smoke will pass away and the coke become well ignited before they are placed in the house. Coke should always be used and not coal, as there is less sulphur in coke and less smoke than in coal.

Third, a building should be well ventilated. The windows should be opened from the top in the daytime and closed at night. This allows the current of air to circulate through the building and carry out the dampness. It is a great mistake to keep the building tightly closed during the time it is being plastered. Fresh air is a good dryer.

Fourth, if the precautions in regard to properly enclosing, heating and ventilating a building are looked after carefully, there will be little trouble with winter plastering. It is not well to paper or paint too soon on new plastering. Even under the best conditions, the plaster finish acts as a bleaching agent, and it should be well seasoned before it is decorated. When it is necessary to decorate quickly, the precaution should be taken of using canvas or an extra heavy coat of sizing before either papering or painting.—D. L. Haigh in Engineering Record.

—THE—

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Mr. Sanford F. Smith, of the firm of Sanford & Smith, architects, Toronto, was married on September 28th to Miss Mabel Beatrice Breyman, of Ottawa.

At Woolwich Arsenal recently transverse breaking tests were made of plate glass from several factories. The thickness of the glass varied from ⅛ in. to 1 in. and the span from 8 ins. to 24 ins. The modulus of rupture, which ranged from 2000 lbs. to 8,000 lbs. per sq. in., was generally greater with the lesser thicknesses. Of the various kinds of glass tested—rough, ribbed, polished and wired—there was little difference in strength except that the wired glass showed a little greater strength than the other kinds. The strength was also greater for the "sandwiched rolled" than for the solid rolled wire glass. The strength of glass set in frames was practically double that of the specimens tested transversely.

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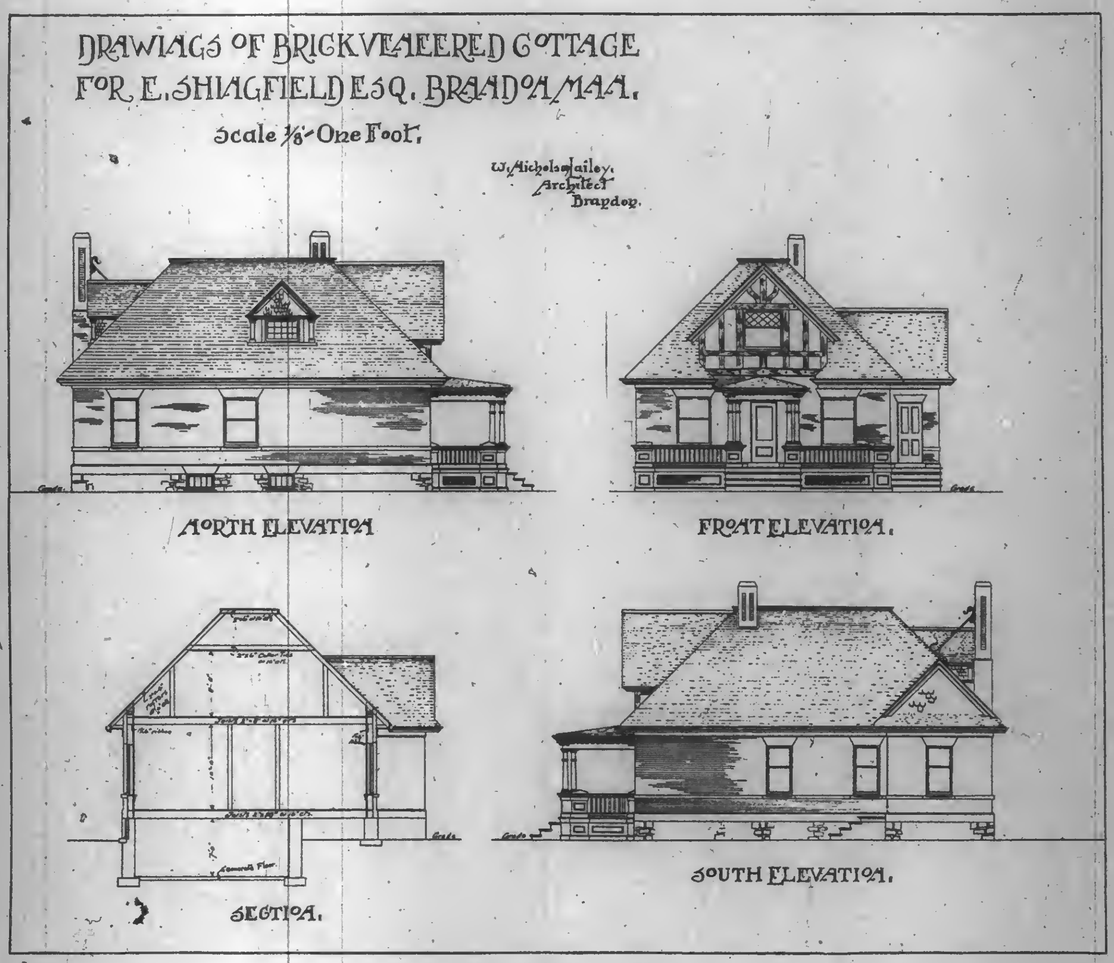

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OCTOBER, 1904

HOUSE FOR MR. SANFORD EVANS, WINNIPEG, MAN.
GEORGE BROWNE, ARCHITECT.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
OCTOBER, 1904

STAIR HALL, HOUSE IN QUEEN'S PARK, TORONTO.
SPROATT & ROLPH, ARCHITECTS.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
OCTOBER, 1904

HOUSE IN QUEEN'S PARK, TORONTO.
SPROATT & ROLPH, ARCHITECTS.

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FIREPLACE IN HOUSE IN QUEEN'S PARK, TORONTO.

SPROATT & ROLPH, ARCHITECTS.

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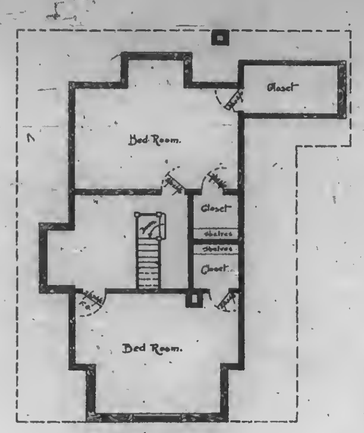
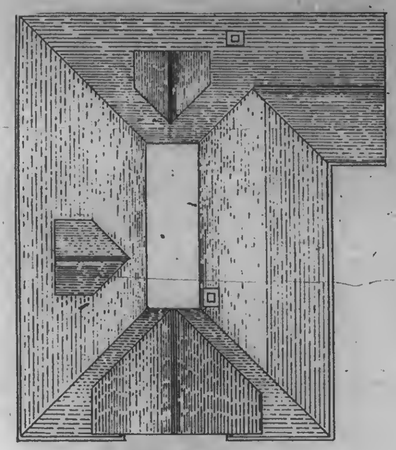
DRAWINGS OF BRICK VENEERED COTTAGE FOR E. SHAGFIELD ESQ. BRANDON, MAN.

Scale 1/8" - One Foot.

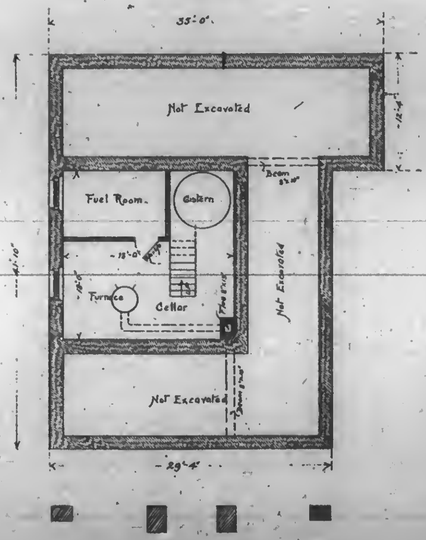
W. Nicholson Lailey. Architect. Brandon.



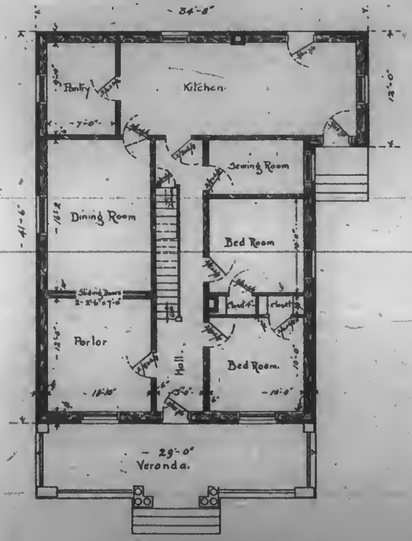
ATTIC PLAN.



ROOF PLAN.



BASEMENT PLAN.



GROUND FLOOR PLAN.

COTTAGE AT BRANDON, MAN.

W. NICHOLSON LAILEY, ARCHITECT.

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The Canadian Architect and Builder

VOL. XVII.—No. 203. NOVEMBER, 1904.

ILLUSTRATIONS ON SHEETS.

First Christian Church, Bathurst Street, Toronto.—S. H. Townsend, R. C. A., Architects.
Palace Pompei Verona—Measured and Drawn by Cecil A. Burgess. A.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Views of St. James Cathedral, Toronto—Cumberland & Storm, Architects.
Design for New Post Office Building at Winnipeg—Darling, Pearson & Over, Architects.

CONTENTS

Editorial	177-178	Toronto Architectural Eighteen Club	188
Some Notes on the Question of Fireproof Construction	179	Strengthening a Retaining Wall	188
Students' Competition	180	Suggestions from New Zealand on Theatre Planning	189
Cost of Ventilation	180	A Carpenter's Epitaph	190
Pictures Without Lenses	180	Northwest Notes	191
Our Illustrations	181	Dynamite in Great Fires	192
The Modern American House in the Architectural Record	181-182	Built all in a Day	192
Cost Plus a Fixed Sum Contracts	183	Winnipeg's Building Record	ix
By the Way	184	Business Notes	ix
Camera in Sculpture	184	Kryptol—A New Substance for Electric Heating	xi-xii-xiii
An Optical Illusion	184	A Smoke Consuming Device	xiv
Montreal Notes	185	Personal	xiv
Addresses at the Opening Meeting of the Architectural Association	186-187		

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The Duty on Architectural Plans.

The Ontario Association of Architects are endeavoring to have changed the present customs regulation fixing the amount of duty to be paid on plans brought in from other countries. Until a few years ago, duty was charged not, as at present, on the value of the plans only, but on the total value of the completed building erected from the plans. In some way the regulation was changed so that duty has to be paid on the value of the plans only. The regulation in its present form is felt to be unfair to Canadian architects, and an effort will be made to induce the Government to revert to the former regulation.

Power From Refuse.

Perfection in municipal arrangements is to be found in Great Britain rather than on this side of the Atlantic. They have crowded cities over there that must be well run if they are to be run at all to suit the English taste for having things in good order. It would do us good to cultivate the same taste and, even at some little cost, to qualify the prevailing shabbiness of our towns. But it is not cost so much as economy that would result from a study of English municipal methods. Administration is the forte of the English and they are making their municipal works pay in many ways. In the matter of refuse destructors, there are said to be one hundred now in operation which supply power for electrical purposes, sewage pumping or water pumping, equivalent to the use annually of 150,000 tons of the best steam coal. An average annual saving of 1500 tons of coal wherever one of these destructors is used must offset the working cost considerably, but there is another point worth considering—that combined works of this kind are better worth having than works where the power is not utilized, inasmuch as the high temperatures which are essential for satisfactory power production are at the same time a guarantee against nuisance.

Concrete Piles

For wet and dry conditions in a piled foundation concrete piles have recently been used successfully as reported in the Engineering Record, in building the Dittman factory, on the canal in Cincinnati, Ohio. The piles ranged from 8 to 22 ft. in length. They were square in cross-section, with a 2 in. bevel on the edges, and tapered 2 inches in 16 feet; being 10 in. square at the point end and 14 in. at the upper end of a 16 ft. length. The piles were reinforced with ¾ in. twisted bars, one in each corner, and these were bound together with ¼ in. hoops, 12 in. apart on centres. These bars turned in at the bottom into a cast iron shoe weighing 50⅔ lb. As it was desired to drive them as soon as possible after being made, a 1 : 2 : 4 mix was used. The piles were aged at least four weeks before being driven. In order to keep the top of the pile from fracture a special cap was used, which was stuffed with rubber from old hose. The hammer used was two tons, and the drop averaged from 4 to 6 ft. Higher drops were used but the record was against them. The cost of the piles is only stated as "considerably more than the cost o

wooden piles per lineal foot," but it is added that "one concrete pile was as effective as two or more wooden piles would have been.

Bad Scaffolding

Mr. R. J. Fleming, Commissioner of Assessment and Property in Toronto, has given his opinion that scaffolding cannot be efficiently inspected by city officials. It would require an army of them, he says. As scaffolds are often put up only for a few hours, it would be quite possible for a scaffold to be erected, to break down, and the workmen who tried to use it to be dead, within an hour ; while the department was still in ignorance of it being erected. The matter, Mr. Fleming thinks, should be dealt with by the workmen. If, he says in effect, through their organizations, they can decide how many hours they shall work, how much they shall be paid for their work in those hours and beyond them, how many hod carriers a bricklayer can keep going, how many lads ought to learn the trade—if they can do all this, surely they can decide the character of any scaffolding upon which they have to work. He might have added that, if work is to get on without continual delays, there must be some more concurrent way of assuring the safety of a scaffolding than by depending upon a visit from a City Hall official.

Clay vs. Iron Drain Pipes.

Modern building by-laws in Canadian citres require that nothing but iron pipe shall be used for drains within the walls of buildings. Outside the walls vitrified clay may be and is frequently employed. In England, however, there appears to still exist a diversity of opinion regarding the relative merits of the two materials. Mr. Samuel Smith in a paper presented at the recent Glasgow Congress of the Sanitary Institute argued strongly in favor of the use of vitrified clay-pipe as against iron-pipe for this purpose. He advanced the opinion that clay-pipe would withstand the action of acids which would cause corrosion in iron pipes.

As a proof of the ability of clay-pipe to withstand hydraulic pressure, he pointed to tests made to determine this question, showing that a 4 inch diameter fireclay pipe was tested up to a pressure of 45 lbs. per square inch without showing signs of porosity. Another test was made to find the exact pressure that a pipe would stand and still be air-tight. The pressure was gradually increased at intervals of ten minutes from .5 lbs. till a pressure of 3.3 lbs. was reached, and the mercury in the manometer remained steady at that pressure for twenty-four hours. From this test it was concluded that the pipe was capable of standing a pressure of 3 lbs. per square inch, or twenty times the pressure required to break a three-inch seal of a washdown closet. Fire-clay pipes were also submitted to a hydraulic pressure of 250 lbs. per square inch without showing signs of fracture, but under this pressure there were signs of porosity in one pipe at 60 lbs. pressure and in another at 100 lbs.

Mr. Smith admits that clay pipes are liable to fracture if not carefully and evenly bedded, and also that great care is required to insure tight joints. To overcome the former difficulty he recommends the laying of a bed or layer of concrete underneath the pipes, and if the ground is very soft or unequal, the use of ferro-concrete. For joints he recommends that nothing be used but slow setting cement thoroughly cooled and and aerated and well staved into the joints so that all the air from the cement is forced out. To prevent breaking of pipes by reason of the settlement of the building, it is recommended that the openings be ample in size and linteled over with a space between the lintel and the pipe.

Mr. Smith's paper has been severely criticized by Mr. W. R. Purchase, building inspector of a Borough Council, who was formerly Superintendent of a large pottery where drain pipes were chiefly made. Mr. Purchase regards the advocacy of clay pipes as a retrograde step, and contends that porcelain iron pipes are the best material to be obtained at the present time for drains, their points of superiority being strength and capability of resisting fracture, reduction in the number of joints (6 ft. and 9 ft. lengths compared with 2 ft. and 3 ft. lengths of clay-pipe) and the greater security of the joints, which are run in molten lead. The weak points in clay pipes he declares to be porosity and weakness in the material, expansion and contraction of the cement in the joints, uneven expansion of concrete, careless filling in of trench by ramming, etc. In this writer's opinion, the drain of the future will be laid in a brick or concrete culvert with stone cover and chambers for access (sufficiently large to admit a man) for the purpose of periodical inspection, the drain to be laid on blocks about 9 inches above the floor of culvert and at intervals of about 3 feet apart. These culverts might also be used for laying the water, gas and electrical mains.

Architects for City Improvements.

The address of Mr. E. Guy Dawber to the Architectural Association of London, from which extracts are quoted in another column, treats at some length, in an address to students of architecture, upon street character as a matter for consideration by architects when building, and implies that street planning should come within the scope of their studies. Mr. Aston Webb, in commenting upon the address, goes a step further and gives it as his opinion that architects should be consulted about "the formation of new streets." As a matter of fact the rearrangement of the approach to Buckingham Palace, made in connection with Mr. Aston Webb's Memorial to Queen Victoria in front of the Palace, is so well done that, though it replaces the old rurality of the Mall, cherished and regretted by Londoners, there is no one who does not accept the improvement with satisfaction. The simplicity and serviceableness of the changes are remarkable ; the place looks as if it had grown that way ; yet the total result is a dignity which makes the Mall, what it was not before, a proper approach to a palace. Anyone who can appreciate the refinement of desigu which has gone to make this result will understand also that it is in the line of an architect's training rather than an engineer's. Mr. Daniel Burnham's usefulness in this direction is recognized by the United States Government. Mr. Burnham is now engaged upon the project of transforming Manila into a modern capital at the cost of many million dollars. He is said to have declared his intention of following the plan which was originally proposed for Washington but was not carried out.

SOME NOTES ON THE QUESTION OF FIREPROOF CONSTRUCTION.

Among the crop of utterances upon the subject of the Baltimore fire we have one now about thicker walls and better laying. These are very simple remedies and, if Capt. Sewell, U.S.A., is right, in his inference from the appearance of fourteen inch walls, that an eighteen inch wall would have stood the heat, the demonstration is one more in the direction of proving, what is much to be desired, the unity of Science and Art. Science is truth and Art is truth, and, where they do not agree, the thing to expect is not their divorcement but a fallacy in one or the other. Mr. Wells, the writer of scientific fiction, groans over the backwardness of the age ; still making walls by the slow process of setting units one upon another ; still wasting time and material in a process that requires walls to be a foot thick to enable them to keep up. Why, he asks, go on with this, instead of setting up a steel cage in a four inch form and pouring in cement ? These anticipations make an architect shiver. Not that he would keep back science. It is the suddenness of the change, that is all. But Mr. Wells has to be sudden or he won't sell ; and Christmas book science is not as safe to lean on as that of West Point and the U.S.A. We can hardly expect any substance to resist the inroad of great heat except by sheer thickness. Capt. Sewell declares that more mass is required to resist a fire than to carry superimposed loads. So we may enjoy the satisfactory reflection that after all the eye is the best measurer of thickness ; that a wall (special circumstances apart) is usually strong enough when it looks strong enough ; for though science, in its most economical precision, would be content with less thickness, capacity for resisting fire requires it all.

In the mean time the new building law for Cleveland, having specified the acceptable fireproofing materials in order of merit as follows :—Brick, porous terra cotta, semi-porous terra cotta, dense terra cotta, concrete, and plastering on metal lath, proceeds to declare that the least thickness of fireproofing material that will be allowed is 2 inches. That is to say, 2 inches of plastering on metal lath is sufficient protection in a fire where a 14 inch wall will not stand. These two statements do not seem to make a very good pair.

The extraordinary thing is that there should be really any doubt about the action of fire when we have had so much experience and when it all counts—for fire never changes. What happened in one big fire will happen in the next, as far as the fire itself is concerned; and, if we are too busy during a fire to study its action, and are not able to read the records it has left behind it, there is nothing to prevent our having a laboratory conflagration and watching its progress through glass. Indeed this is done in effect by The British Fire Prevention Committee, and occasionally for the purpose of special experiment, by other bodies, on this side of the Atlantic as well as in Europe. It will be part of the work of this journal to keep track of such experiments and give practical results to its readers ; but it is high time that such results were not only practical but practicable, and found their way into specifications instead of into files for future reference.

It is time to change our ways. The statement has been made, in a paper read before an English insurance society, that the recent losses to English companies by conflagrations in this country have exactly wiped out the profit to their shareholders during the last fifty years—and the vipers are going to rise the rate on us. This seems to mark a crisis. It is a hint that we are not quite within the pale of civilization. It appears that the people of the United States are in it too, but that should be no encouragement, for they are quick movers over there, and before we know it we shall be alone, marked down for burning, by people with whom probabilities are a science a trifle too exact to make it a comfortable matter to be on the list of suspects.. It is time to change our ways. The question is how to change them effectively. There is no use in talking fireproof construction ; we have done that. There is no use in blaming the architects ; they know all that is known about fireproof construction and would be glad to practice it. It is the architects' clients who condition the state of building and they are the people we have to deal with. The truth about the halting progress of fireproof construction in this country is that the business public do not want fireproof buildings. They would like their buildings to be fireproof well enough, especially after a big fire ; but the wish dies a painful though not a very lingering death under the influence of preliminary estimates for rebuilding with fireproof construction. A conflagration is but a chance after all and the cost of fireproofing is a certainty, and it is not business to balance a certainty of cost against a problematical advantage. There is some return in the reduced cost of carrying insurance but it is not enough to even up the transaction, and there is practically "nothing doing" in fireproof building.

Then comes the cry for stiffer by-laws. Let us force them to build fire-proof ; the extra cost is not a matter of choice, it is a public matter. Very well, let the public establish preferential trade with the owners of fireproof building in proportion as their buildings are fireproof and their prices therefore high. This is a perfectly fair proposition, but in view of the fluidity of cash, which flows steadily to the lowest levels, it amounts to a proposition to make water run up hill. How then is the suggestion to be carried out? It is still true that if the public have a right to say they have a right to pay. How can the public, who share in the advantage of an individual's fire-proof building, share in its extra cost? It is at any rate not to be brought about by sending the Assessment Commissioner after him to rate him for extra taxes for the public benefit on the score of his extra expenditure in building so as to benefit the public. This would not be a good thing to do, but it seems to suggest what would. If a man taxes himself for the benefit of the public it would not be fair (to him) to tax him again on the amount of his own taxation, but it would be quite fair (to other people) to remit taxes to him on the basis of that amount ; and, inasmuch as taxes should be fluid also and level up all hollows in the public estate, the displaced tax should find its settlement on buildings that are below proof in the matter of fireproofing. It is for them and because of them that the firehalls are maintained, and they should pay for their maintenance. Here then is, if not a complete proposition, a suggestion of a direction in which to feel for a string which will make fireproof construction sit up. It would be interesting to figure out the relation between the extra

cost of a fireproof great-risk district and the cost of the fire halls which supply it, to see how far one can be set against the other. There is a proportion of the cost of water supply also which might fairly be charged against the people who won't provide against fire and removed from those who will. If the financial arithmetic works out the working machinery could be devised and then we should have fireproof building settled upon a commercial instead of upon a speculative basis: quod est desiderandum.

STUDENTS' COMPETITION.

Architectural students are invited to send in on or before February 1, 1905, a sketch for a house in a country town, suitable for the residence of a person whose income is $1,500 a year. The house is to be placed on a lot 70 feet wide on the street front by 110 feet deep. The lot is situate on the south side of a street. A block plan must be furnished showing the position of the house on the lot and the arrangement of the grounds. The owner may be supposed to keep no horses or other animals but to be fond of gardening. The plan of the ground floor is to be shown in full on the block plan. Other drawings required will be: 1, the plan of the first floor; 2, the rear (or south) elevation; 3, a perspective showing the front and one side; 4, an elevation of the other side. All drawings to be to a scale of 16 feet to an inch. They are to be drawn in line with India ink on smooth paper or cardboard and are to be arranged within a space in the proportion of 8 inches by 12, and, if possible, no larger than that size. The scale of the drawings is to be, not merely noted, but drawn on the paper. A brief description of the material used in the construction of the exterior must accompany the sheet of drawing. Both drawing and description to be marked by a cipher or nomme de plume, and the author's name, enclosed in a sealed envelope similarly marked, must be sent under cover addressed to the C. H. Mortimer Publishing Company, Confederation Life Building, Toronto. Judgment of the sketches will be made by a committee composed of members of the Ontario Association of Architects and of the Eighteen Club of Toronto. The following prizes are offered: First, $15.00; second, $5.00; third, one year's subscription to the CANADIAN ARCHITECT AND BUILDER, Architects' Edition.

PICTURES WITHOUT LENSES.

Pinhole photographs are obtained by means of a pinhole punched in tinfoil and made to serve the place of a lens in the camera. Excellent pictures, strange and interesting, are thus obtained, and pinhole photography is becoming one of the fads of the day. The pictures lack the extreme sharpness of those obtained by a regular photographic lens, but they have a greater softness of tone which is delighting to the eye and which is equalled only by the artist's brush. A needle serves better than a pin for punching the hole in the tinfoil. The hole must be perfectly round and smooth. Through this the light is admitted to the sensitive plate, the exposure being made in the regular manner. Mr. N. R. Briggs, who has made a study of the new-style photography says:

"The interest manifested in this new objective is due to the fact that it is of universal focus, the rays focusing in the stop; the perspective is true, no part of the picture being out of focus, while interior and architectural photographs are rectilinear, that is, without distortion of any kind, for the rays of light fall directly upon the plate without any interference. It is said that work requiring the sharpest definition, such as copies, reproductions documents, etc., can often be done better by the pinhole objective than with a fine lens. The reason is obvious. A lens often focuses sharper than the eye, giving a staring, unnatural effect to the resulting print."

The Scientific American says: "Another singular feature in connection with pinhole photography is that any size camera may be used. For instance, it will take a picture upon a plate three inches long or twenty inches long. Therefore, it will be seen that all one has to do is to arrange this camera for a small or large plate; and with the latter, interesting panoramic views could be secured. There is no doubt that a very cheap and satisfactory folding camera, in which to use any of the present series of roll films, could be made for special panoramic work."—The TechnicalWorld.

COST OF VENTILATION.

The cost of ventilation in several notable buildings in Great Britain was referred to in a recent paper by Mr. William Henman before the Royal Institnte of British Architects on the plenum system of ventilation. The Glasgow Art Galleries supplied with 9,050,000 cubic feet of air per hour by electric power requiring 66 horse power, costs for power about $1,450 per year per 1,000,000, cubic feet. The Manchester Technical School, supplied with 12,000,000, cubic feet per hour, providing for 3½ changes hourly and requiring 80 horse power, is charged with $1,308 per year per 1,000,000 cubic feet. The Manchester Midland Hotel, ventilated at the rate of 3 changes of air per hour, corresponding to a supply of 6,000,000 cubic feet in that time is charged with 40 horse power electrical energy at an annual cost per 1,000,000 cubic feet of $1,308. The Birmingham General Hospital, with 7 changes per hour or 13,000,000 cubic feet supplied per hour, requires 19 horse power electrical energy and costs about $287 per annum per 1,000,000 cubic feet. The Royal Victoria Hospital, at Belfast, designed by the author, provided with ventilation in turns of 7 changes corresponding to an hourly supply of 5,000,000 cubic feet, and is charged with but 5¼ horse power in a steam plant, costing $97 per 1,000,000 cubic feet per annum.—The Western Architect.

A very interesting piece of work in the way of house raising has recently been executed in Brooklyn, N. Y., in connection with public school No. 85. The structure is located in what is known as the "flooded district," the lower floor being covered with water at times to a depth of several feet whenever there are heavy rains. With a view to remedying this, the building, which is of brick and four stories in height, has just been raised nearly 3 feet. The estimated weight of the building is 7500 tons, and something like 1,000 jack screws were used in the operation of lifting it to its new level. The work was done by 75 men acting simultaneously, and after each turn of the screws the foundations of the building were thoroughly inspected in order to make sure that everything was progressing as it should. The work was done by Miller-Daybill & Co., and is regarded as more of an engineering feat than was the moving back several feet of the Brighton Beach Hotel some years ago, in order to save it from being undermined by the heavy ocean tide.

OUR ILLUSTRATIONS.

THE PALAZZO POMPEII-VERONA.

This fine palace is built on the bank of the river Adige and is a very characteristic example of the robust architecture of Sanmicheli. He was considered the greatest military architect of his day. His fortified gates still form the entrances to the city of Verona and his domestic work shares somewhat of their severe and powerful aspect.

Earlier endeavours to apply the Roman "orders" of architecture to buildings of more than one storey, going on the idea of superposing one order upon another, generally resulted in a strongly marked horizontal division with a lack of vertical connection and unity. The method of employing the orders in an entirely subordinate manner as mere framing to windows and doorways and then crowning the whole building with a huge cornice was satisfactory in point of design but did not satisfy the desire of the Renaissance architects to see the orders glorified to the utmost.

In this Palace Sanmicheli has made the classical order a feature of dominant interest, not simply placed upon another storey of varied design but provided with a basement which seems as essential a setting for such a colonnade as the upper stage itself seems a fitting crown for such a pedestal. The bold suppression of any projecting cornice between the two parts contributes largely to this excellent unity of effect.

This is one of the earliest buildings in which a classical order is placed upon a rusticated basement—a treatment again employed by Sanmicheli in the Canossa and Bevilacqua Palaces at Verona. It became one of the most favourite motifs in the later Renaissance of England.

CECIL S. BURGESS.

POST OFFICE, WINNIPEG.—MESSRS. DARLING, PEARSON & OVER, ARCHITECTS.

In plan this building has the usual post-office arrangement—space for the public along the front and side walls, working space in the centre, and the vestibule for the reception and despatching of mails in the rear, opening on a lane. The principal public space, where are the private letter boxes, is along the front—the ground floor of our illustration—and at one end, in the pavilion on the left, are the stair and elevators.

The dimensions of the facade are 134 ft. by 70 ft. to the soffit line of the cornice. The material will be Tyndall stone throughout. The building is of skeleton steel construction, with floors of terra cotta arching covered with four inches of cement and a hardwood flooring. The stairs are of cast iron. The flooring and the doors are the only structural wood. The window frames are of metal and are glazed with wired plate glass. The windows have also iron shutters. To deal with fire within the building, five stand pipes are arranged.

Provision has been made in the basement for establishing the plant necessary for a pneumatic tube system.

Examination of the design shows a simple arrangement of five bays and two pavilions, kept broad by due distinction between the bays and the central portion of the facade, and by subordination of the horizontal lines of all windows between the basement and the cornice, and harmonized by a balance between the scale of the three storey order and the rustication of its setting. The rustication of the basement is carried up into the pavilion and these are further distinguished by the vigorous subtlety of the pedimented composition which unites the three storeys of windows. The cornice bounds the whole, and the composition up to the attic is a fine piece of rich harmony. The attic, which will, no doubt, in execution have to dispense with the support of the roof from ordinary points of view, has been given an interesting skyline by combining dormers with the balustrade. The top storey of the pavilion, being above the cornice, makes a complication difficult to treat. It partakes partly of the nature of an attic, which must be kept down, and partly of the nature of a crowning member, which should be enriched.

It is worth noting that the architects have helped their own building by accepting as far as possible the vertical heights of the existing adjacent building. Their own composition gains by treating the other as an appendage and they have certainly saved the life of the little one, and—which is a great point—helped instead of injuring the street.

THE MODERN AMERICAN HOUSE IN THE ARCHITECTURAL RECORD.

The October number of the Architectural Record is devoted to a study of the Modern American House. In a preliminary chapter the writer deplores the present state of affairs in which the decorator is independent of the architect. "One man or one firm," the Record says, "should do all the necessary designing, and the function of the professional decorator should be to carry out the architect's ideas. . . . The architect, whatever his limitations, alone represents a good aesthetic tradition. The American business man and his wife have no aesthetic traditions at all. . . The professional decorator may have in his employ designers as competent as the average architect, but"—he is in short in business and his only concern with his client's state of taste is to satisfy it and take his money. "He works entirely by routine." The writer might have added that the decorator's competent designers must be very competent indeed if—especially in the time usually at their disposal—they can fall in exactly with the taste of every architect. It needs moreover a liberality of mind such as we do not find, for instance, in the distinguished foreign artist in Punch who, replying to the owner's objection that a proposed scheme of decoration will kill his high blue dado, says, "'E is a beast, your 'igh blue dado, and I veesh to keel 'im very mosh indeed."

The writer has no sympathy with the æsthetically austere and ungracious rooms which some architects seek to force on their clients. The demand for a cheerful, comfortable and homely atmosphere in a dwelling is absolutely a legitimate demand, just as the demand that the interior should be thoroughly designed is also legitimate; it is the action and reaction between these two demands which will most effectually serve to give American (and Canadian) interiors the mixture of propriety and distinction which they need. At present distinction is too often obtained at the expense of propriety and comfort, and propriety and comfort too often obtained at the expense of distinction.

In the matter of the Hall, the Record seems to be quite complacent about the treatment of the hall as a sitting room "even if by so doing the other rooms of the house on either storey are somewhat crowded or diminished in number." This surely is distinction at

the expense of propriety and comfort. The house in which the necessary accommodation has to be "somewhat crowded" in order to admit a hall large enough to be planned as a sitting room is in the category of people who aim at the distinguishing marks of those who are in a superior class. To give a small house the style of a large one and a city house the freedom of a country house is at the bottom of the feeling that prompts to made of the hall "a sitting room differing from others by the fact that it has no solid partition between it and the entrance hall." Cold comfort, one would say, and scant seclusion! The separation of the staircase from the hall is another thing and there are some suggestive illustrations of halls in which the course of the stairs is concealed or partly concealed, sheltering the stairway from draughts and the persons ascending and descending it from observation. The writer in the Record thinks "these are always dangerous to the designer, because the raking lines of the stair are always difficult to manage and produce ungainly spaces, shapes and combinations." The application of this statement is evidently to the partly screened staircase, but the illustration, which shows a good deal of the stairs, does not suggest any danger to the design from their raking lines appearing, and certainly not one one would think from their appearing less than usual. Much concealment meets the writer's approval; "the more a stair can be built in between walls generally the better thing it is."

The living room brings out no special doctrine except the general assumption of such a room, (when it is not crowded out by a hall sitting room), and its qualification by a smaller room opening off it, which qualification may take either of two directions: The small room may be a more intimate room into which to retire for greater privacy, the large room being practically a drawing room; or the small room may be a less intimate room, intended to hold strangers off so that the large room may be devoted to the family and their more intimate friends.

The illustrations of the living room are however well worth studying; but one should have a pretty strong reading glass with which to examine them, if one is not to be daunted by their apparent size. In order to receive a true impression from a photograph of a room it is necessary to get the size as nearly as possible in the position of the camera when the photograph was taken; that is to say as nearly as possible against the surface of the paper. Otherwise the room appears much larger than it is; being measured in an illusory manner by an instinctive extension of the perspective lines to a vertical plane at the position of the eye. A good reading glass, giving nearly the true point of sight, enables one to realize the design in small photographic illustrations, and when the half toning process work is not too coarse, adds greatly to the pleasure of looking at them.

The section devoted to the dining room makes one in love with the circular dining table. There is in the the first place, if not a saving of space, a better application of it. A table 5 feet in diameter is said to seat eight persons comfortably. That means a little less than two feet for each person at the table's edge. This would not do at a rectangular table, but when one reflects that the governing condition for seating space at a dining table is not plate-room but elbow-room, it is clear that the trapezoidal space occupied by a sitter at a round table favours this, for the space increases with distance from the table and elbows do not (in the first families) come to the front. Moreover an important factor in chair spacing is room for service, and this is automatically taken care of, when the table is round, by the greater separation of chairs at the back.

So the round table has points in its favour beyond the square, which is also advocated in the Record; but, as far as the room is concerned the conditions are the same; "the long room will be found much modified." The oblong room is a fine thing and we may miss it, but not in a small house. There it is a crux, and a room that is square or approaching the square will fall in much better with the rest of the house. The room need not however be square; there is other furniture, besides the table, to be provided for. The table may be placed at one end, and the attractive proposition is made (for houses in which summer is the chief consideration) to treat this end as a projecting bay which, if its windows are made to open up well, will be "almost the equivalent of a verandah."

Among the illustrations of dining rooms is one in which there is a high wainscot, finishing in line with the top of the door architraves and leaving just enough space between its shelf and the ceiling to place some oil portraits, all of the same square size. This would be fine if it were not that the portraits (no doubt in order to be seen) lean forward a little, and so come in front of the wall beam of a heavily moulded plaster celling. This is a pity but affords a suggestion that in rooms of moderate extent, which are finished in this way with pictures or decoration on the wall surface which remains above a high dado, that portion of the wall should lean slightly, as the portraits do in this illustration.

In the bed room section the principal point is advocacy of its arrangement so as to serve also as a sitting room, by partitioning off the toilet apparatus and (of bedroom furniture) leaving in view only the bed. The suggestion is made that we should take a hint from the hotels and place the toilet closet and the hanging closet on the inner end, leaving a vestibule to the bedroom between them. Most Canadians will require to be sunk a little deeper in civilization to come to this proposition cheerfully. The closet (with electric light or even with a window on the room side) is all right, but the proposal to light—and ventilate—the toilet room from the hall makes one's heart sink. With a rotunda down stairs in the hall and borrowed lights in the bedroom passages there would be too much hotel about the house. The writer, by the way, speaks of a fanlight over the bedroom door as if it were a recognized necessity; it is a question whether it is not more generally recognized as a nuisance. In the very plan in The Record, which is supposed to have a fanlight, the proper means of bedroom ventilation is shown, in the shape of a bay window; and unused, as one side is unlighted though there is no apparent objection to its having a window. We are too apt to stop our bay windows with the living rooms; whereas in the bed rooms, where they furnish the necessary choice of direction, to avoid much exposure in a window that will remain open while we are asleep, (or in summer to get it,) the bay window is a boon. A circular window of the kind forms an essential part of the plan which is presented to us in The Record as perfect—and perfect it is. Here the toilet compartment has a window of its own and a door of its own: it is in fact a dressing room. The proposition therefore becomes that, if we wish to make a sitting-room of a bedroom, we must have a dressing room attached to it. The situation implied by these precautions about toilet furniture—the reception of visitors in a bedroom—is not after all a common situation. Where it occurs, the Universities offer another hint, perhaps better. A slight extension of the dressing room makes room for a single bed. The bed room and sitting room are thus made quite distinct by day while at night they become one good sized sleeping room.

The kitchen description is on a scale of such splendour—glazed tile walls, rubber tile floor and "a telephone to each bedroom, hall, drawing room and dining room"—that it almost quells practical interest. With the exception of the telephone—suggestive of a practice of eating between meals, which is to be deplored—the rooms and fittings are however only a high expression of conditions that are necessary in all kitchens, and the section, which is chiefly concerned with the usual appliances, is well worth reading.

COST PLUS A FIXED SUM CONTRACTS.

The following circular letter from Frank B. Gilbrett, general contractor, New York, has been furnished by a prominent contractor in reply to a letter from the office of the CANADIAN ARCHITECT AND BUILDER asking for an explanation of this system.

DEAR SIRS,—I would like to explain to you in detail our method of contracting for building construction on a basis of Cost-Plus-a-Fixed-Sum. In 1901 approximately 30 per cent. of our work was on this basis; in 1902 45 per cent.; and during the year 1903 we completed contracts amounting to several millions of dollars, 70 per cent. of which was on the above mentioned basis.

When about to contract for work on this basis, we proceed as follows:—When the general plans are ready we estimate by the cubic foot basis what the actual cash cost of the proposed construction would be to us. We figure 10 per cent. of this estimated cost, and call it the fixed sum referred to above. For example, if we estimate that a certain piece of construction will cost us $150,000, we contract with the owner or his representative to do the work for actual cash cost to us plus $15,000.

By contracting for work on this basis the following results are obtained:—

First—The owner gets the building at a minimum cost.

Second—The building is completed as rapidly as is consistent with good workmanship.

Third—The owner is insured the best workmanship.

Fourth—The construction goes on without disputes over extra work and costs of changes. The owner can have the architects change the drawings and specifications at any time, knowing that there will be no dispute or delay in the construction made necessary by adjusting compensation to contractor.

Fifth—The owner, or his authorized representative, has at all times full control of the construction.

If we consider each of these results more fully, I may be able to explain how they are obtained.

1. "The owner gets the building at a minimum cost." From an owner's standpoint the cost of the building may be divided into three parts, the cost of (a) labor; (b) material; (c) contractor's profit.

The labor (a) on such contracts is handled as follows: we put on to the contract as many men, and these of such trades, as we believe the conditions require. We aim to have the best possible labor, but if the owner or his representative is not satisfied he may substitute other labor or discharge any man, at any time, without giving a reason for so doing. This insures getting the best possible labor.

The materials (b) are obtained in the following manner: we carefully schedule each and every class of material required, and attach to the schedule shop drawings, when such are necessary, so that every concern estimating on materials knows exactly what is wanted. For example, the cut stone schedule has attached to it shop drawings showing every stone in such detail that the stone cutter can cut all the stone from these schedule drawings. These schedules are submitted to all concerns that we know to be reliable and equipped to furnish the materials. We are particularly well qualified to get estimates for furnishing materials; not only because we have clerks in our employ whose constant work is that of making schedules and obtaining subbids, but also because we have offices in New York, Boston and Baltimore. The owner or his representative is also furnished with copies of these schedules, so that he can himself call for bids for furnishing the required materials if he so desires. The sub-estimates, being based on the same schedules, are very easily compared; and, after considering price, time of delivery and capacity of the sub-contractors, we send them, with our recommendations, to the owner or his representative, in concise form on a blank called a quotation list, which is especially designed for this purpose. We then award the contracts in accordance with the instructions of the owner. Orders for materials are in triplicate; one copy goes on record at our office, one copy goes to the owner's representative immediately, and the third copy remains in the order book. By this method the owner, his representative and the contractor are able to tell at any time what the itemized cost of the construction has been to date.

From the above it is obvious that the owner or his authorized representative has full knowledge of the cost of materials even before they are purchased; and I think it is also clear that the materials are obtained at a minimum cost.

Concerning the contractor's profit, it may be said that the contractor receives only a reasonable compensation for his services. This being fixed before he starts the construction, remains unchanged. The owner should certainly expect to pay said compensation on all construction, especially when he considers that the fixed sum is not all profit to the contractor, who furnishes plant, etc., gratis. On percentage work there is sometimes a feeling that the contractor is running up the cost to increase his profit. This does not occur when work is contracted for on a basis of cost-plus-a-fixed-sum. When the profit is a fixed sum there is no incentive to the contractor to increase the cost. When work is contracted for on a lump sum basis, there is an incentive to slight the quality of the work, and to let the work drag along slowly.

This proves, I think that the contractor's profit is best dealt with by the cost-plus-a-fixed-sum method of contracting.

2. "The building is completed as rapidly as is consistent with good workmanship." Since the contractor gets no compensation for length of time, he will naturally complete the building as rapidly as possible, so as to obtain his compensation, and to have the use of his plant elsewhere at as early a date as possible. When work is being done on a percentage basis it is generally slow and costly. This is not the case when work is contracted for at cost-plus-a-fixed-sum.

3. "The owner is insured the best workmanship." This is obvious, for the reason that it will in no way be to the contractor's advantage to do any but first-class work. If he did poor work he would lose chances of getting other contracts from the same parties. This we realize to be very important, since seventy per cent. of our work last season was from owners and architects for whom we had previously completed contracts.

4. "The construction goes on without disputes over extra work and costs of changes. The owner can have the architects change the drawings and specifications at any time, knowing that there will be no dispute or delay in the construction made necessary by adjusting compensation to contractor." As charges for extra work do not affect the contractor's profit, there is no cause for dispute. The construction goes on as smoothly as if no change had been made from the original design. When work is contracted for on a lump sum basis, there are invariably disputes over the detail drawings, extra work and changes, and these often have to be adjusted at the completion of the work by a Board of Arbitration. This is always disagreeable. Such bad conditions do not exist on any work that is contracted for on a basis of cost-plus-a-fixed sum.

5. "The owner or his representative has at all times full control of the construction." This has been shown in speaking of results one to four.

You will note that by this method we have eliminated the most important of the disagreeable factors which enter into ordinary contracts and we have embodied in this method many desirable features which do not exist in lump sum or percentage contracts.

All that remains to be said in regard to Cost-Plus-a-Fixed-Sum contracts is that we are extremely well equipped to handle work on this basis.

Yours truly,

FRANK B. GILBRETH.

BY THE WAY.

The wasteful mountain torrent in California and the arid land are being brought together by the aid of long-distance transmission of electrical power. The wilderness promises to blossom as the rose; for the dessicated fertility of these lands is of long accumulation and abounds with fruit under the simple influence of water. The water is there but beneath the surface so far that horse-power is required beyond the power of horses. Mountain streams have been used to supply power to pumps as much as a hundred miles away, and the Kern river is being, or has been, harnessed for the great orchard and farming regions, 125 miles away. This, though primarily a Californian affair, has, like most things now-a-days, a bearing upon our Imperial question. What is possible in California has excited attention in India as possible for India; except that there it is paddy and jowra and bajra that propose to lift their heads; and, though it is somewhat of a leap in the dark, we may affirm that it will be a good day for India when paddy prospers and jowra and bajra are within the reach of everyone.

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Excavations of foundations for two or three large buildings in the down-town district of Chicago will be made in a novel way. Chicago's down town streets, as now is generally known, are paralleled forty-six feet below the surface with tunnels corresponding to the streets above. In order to get rid of the earth from the building foundations the Illinois Tunnel Company, owning the underground tunnels, will extend spurs from their main tunnels to a point about the center of the lots to be excavated and wells will be dug connecting these spurs with the surface. Steel cars of about 20,000 pounds capacity are being built, which will be run to a point at the bottom of the wells, and earth from the foundations will be shot down the well into these cars. An outlet for the earth thus set below ground will be provided on the lake front, where the cars with their loads of dirt will be elevated up a well and run on tracks to the dump.

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The chairman of the London County Council has, in an opening address, been reviewing the work of the Council during the fourteen years of its existence. Among bewildering thousands of persons rehoused and millions of people carried over the Council's tram lines we meet with one figure that is a recognizable achievement: the death rate has decreased by 40 per 1,000. That is something definite and a great improvement. It is attributed to the clearance of slums, the building of better houses and the opening of parks and recreation grounds. There is no doubt that this attribution is right and it is encouraging. To support the intolerable deal of preliminary talk that is necessary to get public improvements done, particularly those which affect the welfare of the classes who do not or cannot concern themselves in the matter, it is necessary to have a clear consciousness of the certainty of results; otherwise the dread of becoming a Mrs. Jellyby creeps over the promoter and makes him flabby and irresolute. Here then is evidence that cleanliness, comfort and beauty are practical matters, and that the result is not only definite but so quick in coming that effort and expenditure to get and maintain these conditions is not over-altruistic.

CAMERA IN SCULPTURE.

Charles Boesse, who recently invented a new process of photo-sculpture which, according to the scientific publications, is destined to revolutionize the photographic art, has arrived in Rome, where he intends to start his first establishment. The young inventor was born in Florence; his father was German and his mother French. He is only 25 years of age and admits that he owes his discovery to chance.

He explained the way he is able to produce in relief all sorts of pictures by a very simple process. The fundamental principle of the invention lies in the discovery that gelatin, sensitized with bicromate of ammonia, loses the property of absorbing liquids in proportion to the length of time it has been submitted to the action of light. A cake of such gelatin immersed in a special liquid under a photographic negative will after a while show relief and depressions, representing the image on the negative.

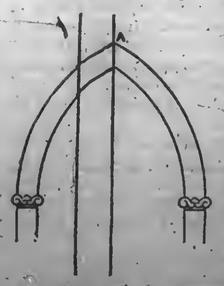
The difficulty in M. Boese's invention was to procure a negative in which the transparency would be proportioned to the degree of relief which it was desired to obtain. In order to do this the object to be photographed is placed in a dark room in front of a specially constructed camera and a special blue light, filtered through a red prism, is projected on it. Two poses are necessary, so that, having obtained the first impression, the operator rapidly reverses the negative and takes a second picture on the same plate.

This negative is developed like all photographic negatives and is copied on film, after which the two pictures are laid one on the other, and thus a negative is obtained totally different from the ordinary photographic negatives. If the cake of prepared gelatin, immersed in the special liquid, is exposed to the light under this negative in five or six hours it will reproduce the picture in relief with the utmost perfection of detail.

Mr. Boese already has given practical demonstrations before the Camera Club and the Royal Institution of London and the Urania Society in Berlin.—Toronto World.

AN OPTICAL ILLUSION.

The engraving represents a Gothic arch bisected at one side by a straight column, the apex of the arch being at A. On looking at the two sides of the arch, it will seem impossible that both can be of the same degree of curvature, or that the line of the shorter side, if extended, will join those of the longer. It can, however, be very easily proven by drawing two lines with a pencil across the straight bisecting lines, when the arch will at once appear in its proper form, although until this is done the eye refuses to perceive the fact, and the appearance of two dissimilar arches persists. This illusion is of practical importance to architects, who, in planning buildings with arches, should avoid placing columns in such a position that the arches will be unsymmetrically divided by them. — Popular Science News.



MONTREAL NOTES.

A number of new buildings are now in course of erection in the neighborhood of McGill University. The college buildings themselves are a somewhat disjointed and oddly assorted crowd, but the grounds with their grass and trees form a pleasant feature in the western part of Sherbrooke street—the only street in Montreal which one can be really proud of, and that more for its good surface and fine avenues of trees than for its architecture. There is reason to hope that in this latter respect also we may soon see some improvement. The space in the college grounds having become pretty well occupied with buildings, there now appears a tendency to expand along the farther side of Sherbrooke street. As the property here can probably only be purchased in comparatively small lots a less promiscuous and probably more severe and dignified placing of the buildings will have to be adopted. At the corner of McGill College avenue and Sherbrooke street the new McGill Y.M.C.A. building is now in course of erection from the designs of Messrs. Finley & Spence. The more important facade is of freestone, the other of brick. A little east of this at the corner of Victoria street excavations and foundations are in progress for the Students' Union Building.

Not far from these buildings in Peel street there has just been completed the shell of the new clubhouse of the Montreal Amateur Athletic Association from the designs of Messrs. Brown & Mitchell.

Much care and skill has obviously been brought to bear on the architectural treatment of this building. On a base of Montreal stone the walls are of brick to which the employment of irregularly scattered black headers gives a certain richness of colour. Freestone cornices and window dressings are used. A strongly Greek flavour has been given to the design generally and more especially to the details. Thus the openings are straight-headed—the ground storey is finished at top with a broad stone band with carved fret ornament; on this stand six flat and broad pilasters extending through the next two stories. A strong entablature crowns this range of pilasters and above the main cornice is a classical attic storey. The doorway in the center of the building of very simple square-headed form impresses by its size and depends for richness upon broad surrounding mouldings and simple cornice all carved with ornaments of a very pronounced Greek character.

One cannot help being a little afraid that the popular verdict on this building will be that it is a square factory-like block. Two circumstances militate against it. The first and most obvious is the tremendous extent of the wing elevations to which the treatment adopted to vivify the front has not been extended, and their huge inert masses have a deadening effect upon the whole, the more so that the street not being a very wide one the passer by takes his impression of the building from some distance along the road where one or other of the great flanks is well in view. The other circumstance referred to is the fact that the mass of the building is in brick—a material with a considerable degree of colour, therefore tending to detract from the force of a design of delicacy and intricacy because the shadows and high lights caused by slight projections and which would be obvious enough on a building all of stone become lost where the mass is of brickwork. Here, though it is somewhat beside the mark, one may recall the banded treatment of brick and stone used in many fine old buildings of Belgium and Holland—a treatment which restores to the eye the ability to follow not by the light and shade but in another and very charming way all the little "ins" and "outs" of a wall surface. In that case however the colour so far from being simplified is rather heightened and demands the adoption of architectural forms especially suited to that method of building.

Before leaving the fine building of the Montreal Amateur Athletic Association one cannot help wondering whether the jewels of Greek imagination can ever be set so as to appear a natural product of plutocratic materialistic Montreal.

At the corner of St. Catherine Street and Greene Avenue there is now almost ready for occupation the new branch of the Royal Bank of Canada designed by Messrs. Maxwell. This building has two facades of sandstone standing on a base of limestone. It is of no great size—the total height is probably less than 40 feet—but it arrests attention by its appearance of compactness and unity. Any one who finds delight in stones of generous size may contemplate this building with great pleasure. The courses of the masonry are 21 inches deep and the blocking course on the top seems about 3 feet deep. This with the general air of breadth and simplicity about the little building comes upon one like a breath of fresh air after having to fill one's eyes with so much of niggled and unwholesome tawdriness that swarms around. As might be expected from an architect with an appreciation of good stone the details, the cornices and the quaint Ionic capitals are worked out in careful and even recherche manner. The main doorway and large front window mutually

trespass on one another's domains in an audacious if picturesque way that must take the breath away from an ordinary law abiding citizen.

A little farther on in Green Avenue a small branch building of the Bank of Montreal has recently been erected by the same architects and shows the same quality and finish though not the same breadth and simplicity as the Royal Bank just described.

CONCORDIA SALUS.

Mr. W. C. Harris, A. R. C. A., architect, of Halifax, Nova Scotia, spent a few days in Toronto recently, en route to the World's Fair at St. Louis.

ADDRESSES AT THE OPENING MEETING OF THE ARCHITECTURAL ASSOCIATION.

The new president, Mr. Guy Dawber, made a long and useful address from which, as printed in the Building News, we make the following extracts, which are concerned with matters of interest to the profession in this country.

THE LAYING-OUT OF STREETS AND DIVERSITY OF DESIGN.

We are living in a wonderful age of building, when houses, streets, great towns indeed, spring into being almost in the space of days. In London, large schemes are in hand, such as no previous generation has ever known, and which are changing the character of whole districts. The most conspicuous feature in this new architecture is its entire absence of uniformity or consideration of surroundings. Architects, with varying success, have given rein to their imaginations without allowing themselves to be controlled or influenced in any way by neighbouring buildings; so that our streets present a want of character and scale which is singularly unsuitable in a city such as this. That this should be the case where many of the buildings individually are most admirable, is lamentable, and I cannot help thinking that it is a matter for regret that in this country we have no Ministry of Fine Arts, or some consultative committee on art who could advise when sites come into the market, or buildings are pulled down, as to the form the rebuilding should take, or what improvements or modifications in the design would conduce to the future dignity and beauty of the City.

It is, perhaps, too much to hope that the London County Council will control the capricious talents of architects and builders in Aldwych and Kingsway, but the greatest opportunity of recent years will be lost if such sites are allowed to be covered with individual erections—the creations of commercial syndicates, too varied in style and material to give any dignity or character to their environment. The recent changes in the Strand have proved that a great deal of the beauty of Saint Mary's came from the fact that the church was so well fitted in style and size to the position in which it was built, and to the height of the houses around it. I venture to think this essential principle is not sufficiently regarded in most of the new buildings we see on all sides. This feeling of inequality and lack of proportion is more noticeable in our street architecture than in anything else—there is no settled tradition in building; no definite aim or standard in view, and all treat different things in different ways, and the "loudest" and most garish edifice attracts the most attention. This, again, is emphasised in the treatment of our shops, where massive buildings, many stories high, rest with no visible means of support upon huge sheets of glass, whilst the facades of many others are covered and disfigured by enormous letters and advertisements. It is indeed strange that we should, as a nation with some claims to taste and refinement, tolerate these shams and eyesores that mar and spoil the finest streets of all our large cities and towns.

I cannot help thinking we have lost a good deal in the beauty and consistency of our street architecture since the days when such men as the brothers Adam, Chambers, Nash, and the Woods of Bath gave us their quiet facades and street fronts, all based on some definite idea and planned on a big scale, and though perhaps slightly uninteresting to us to-day, yet possessing dignity, scale, and symmetry. In street architecture the mass should be the main idea and the individual building should be subsidiary to the general design, but exactly the opposite seems to be the prevalent idea to-day, and one cannot help looking forward with some degree of misgiving to the result of such experiments as we see in Regent-street, which break the simple lines and grouping of what, however much its monotony may be abused, possesses some claims to design on a monumental scale.

Without doubt, all this variety, this diversity of idea and design which we see everywhere throughout the country, is attributable to our lack of architectural education in the past—we have not learned in any school, nor on any method, and hence our architecture, like our training, is individual and haphazard, everyone building what best suits his taste, just as our students study or pick up their ideas in a like manner. On the other hand, in essentially domestic architecture this country stands pre-eminent. Our country houses possess a character and quality of which we may well be proud, and in this branch of our art a common sense and legitimate use of material is producing a style that stamps the building of to-day. In municipal architecture we have also vastly improved during the past decade, and many of our modern buildings are well worthy of comparison with the works of masters of bygone years.

But as a nation we have quite failed to recognize the importance to the community of well-thought-out schemes of building and their environment on a large scale. We lack in England that spirit of civic pride which is so pronounced abroad—a pride in the beautifying of our cities and towns that makes one vie with the other in a display of noble buildings, dignified squares, and that co-operation of architect, sculptor, and painter, which alone can produce great and noble works of art. The least observant cannot fail to be struck by the feebleness of conception shown in dealing with the various sites that come into the market. It is deplorable that they should be regarded merely as commercial speculations, to be covered with buildings with neither character or individuality, and without the least regard for their surroundings, and perhaps more than anywhere else this is seen in the development of our suburbs. On the Continent this problem is dealt with in a systematic way, and the various municipal authorities prepare the lay-out of the general scheme, the lines along which the extension is to take place and the proportion of the whole site which may be covered by buildings. It is a great pity that our English town councils do not study the admirable work of town extension now being done in Germany, and do not obtain Parliamentary powers to do similar work here; our towns might then be developed and improved on broad and dignified lines instead of the haphazard way we now deal with a question that is worth far more consideration than is given to it.

Experiments have been made in recent years in this country, of building and laying out towns and villages on some artistic basis, and with very satisfactory results. The paper that was read last session on the Bournville settlement, showed that these buildings could be erected to pay a fair return of interest for the outlay, and entirely disposed of the fallacy that to build artistically is more expensive than otherwise. There can be no doubt that the influence of communities such as these must eventually have a great effect on the taste of the public. But unless this question of the extension of London suburbs is dealt with on some such lines, we shall be surrounded by a belt of appalling monotony and ugliness, as every suburban extension makes the existing suburbs less desirable.

ARCHITECTURAL DESIGN.

Gentlemen, all these are broad questions not unworthy of your careful consideration, and though they may appear to our younger members as dry and uninteresting, it is essential that they should be conversant with such matters, which in after years will force themselves on their attention. But do not believe that architecture has vanished as the pessimists say, for at least we are not satisfied with its substitute, and though houses and costumes perhaps fall short of mediæval grace and color, yet both are tending to become more seemly and convenient than those our forefathers knew. Slowly, but surely, we are striving for, and I think arriving at, that combination of beauty and utility wherein lies the truest, perhaps the only true art, and we have to-day an ever-increasing body of able and thoughtful men, who are doing work that is worthy of our highest admiration, and which is awakening the interest of the public in an art which for years past has been regarded with comparative indifference. In architecture, decoration, and the plastic arts, there is a strong and virile movement permeating the country, not only to treat material sensibly, but with freedom from the fetters of bygone schools of design. It lies in your power to forward this movement, to train your hand and eye, to study and labour in the profession you have chosen, remembering always that as the coming generation of architects with you rests a great responsibility. I would have you think of architecture from a national standpoint as a great power, and make up your mind from the day you enter the profession to devote yourselves to the uplifting of the noblest of all the arts. Your work will be your greatest recompense, and if you throw your heart into it you will find it a never-ending pleasure and engrossing pursuit to the end.

Look at things largely and try to think in the mass, and do not design your buildings as separate elevations, but picture them in the round, as imaginary buildings, that you can feel and handle, and plan out the surroundings, and the environment, so that the whole is complete in every way. If you accustom yourselves to this habit of thinking of your designs as a whole, you will be surprised at the grasp of idea it will give you and the increased pleasure you will get out of your work. Study the work of our best living men whenever you have the opportunity, as well as of those long since dead, and do not neglect the prosaic present for the picturesque past.

Whenever you see a beautiful building or work of art, either one just completed or an old one coloured by the mellowing hand of time, one that instinctively impresses you by its sense of proportion and fitness, try and analyse it and find out what it is in its conception and construction that produces this effect. The cultivation of this habit of analysing everything you see, of dealing with actual existent facts, will help you to design and plan far more than studying books and illustrations.

The reason we admire old work so much is, I think, partly sentiment and partly because it is, as a rule, thoughtful and honest—there is a feeling of reposefulness, of satisfaction and charm that so much modern work misses, and it is this spirit, this intangible something that one feels but cannot express in words, that you should strive to attain and which will give character and beauty to your work. It is the spirit and the thought behind the design that makes a beautiful building, and the more thought you put into your work the better and nobler will it be.

SKETCHING AND MEASURING.

In these days, when travelling is so easy, you should take every opportunity of studying and comparing in each country you go to the different ways in which similar problems are treated, and the materials and workmanship with which they are carried out; this will broaden and enlarge your mind, and you will gain many valuable lessons in design and construction. But do not sketch or measure with the object of copying old forms and features, for mere servile imitation is a sure sign of decadence and lack of creative force. At the same time avoid going to the other extreme, and in your efforts after so-called originality becoming "banal" and grotesque. Guard against being carried away by the love of the pretty and picturesque, the passing fashion of the hour, and recollect that eccentricity is not synonymous with genius. Do not worry over trifling details, trivial mouldings, and such things; the greatest and noblest buildings and those that impress us with their breadth and dignity, as a rule, are very simply treated. You know that ornament must follow good construction, and that this again must be based on the proper use of material, and, though the tendency of the day is to try to be original, to produce something fresh and striking, yet I venture to think, and indeed hope, that much of what we see around us is only ephemeral and will not hold its place in years to come, as representative of our architecture to-day.

Beauty in architecture does not result from richness of material and profusion of ornament, but from elegance of form and proportion, harmony of colour, and perfection of execution; and in a large measure from the intelligent application of material to its proper purpose. Many do not sufficiently remember this, and forget that all materials have their limitations and uses; so consider well the suitability of your designs to the materials you would build them in. Details and features that are right in one are wrong and out of place in another. It is unnecessary to urge you again to err on the side of simplicity and restraint in your work. Everyone can crowd his design with meaningless ornaments and detail, but few have the power of being able to know exactly what to use and what to omit. This can only be gained by careful study, by thought and experience, and though at times you may get discouraged and feel that your work is at a standstill and you are not improving, yet this very dissatisfaction may be the means of benefitting your work in the future.

THE FUNCTION OF AN ARCHITECT.

I cannot help feeling that if a man means to be an architect all his time and thought must be concentrated on his work and in that direction alone, and to attempt to make himself master of any of the subsidiary crafts, to work with his own hands on buildings of his own is a mistake. I have never been able to ascertain that

any of the greatest architects of the past were craftsmen in the sense that we use the word to-day, and I do not think that any work in any of their known buildings can be pointed to as actually executed by them. The function of an architect should be to design and have the control of the entire building, to be the master builder in fact, and to be conversant with all the work being done. He should, as far as possible, have a knowledge of the technique of the various trades and crafts, and be able in a general way to direct and control them all, but more than this seems unnecessary. To concern himself personally with matters of actual craftsmanship must be to the detriment of his buildings, because an architect cannot carry out the multifarious duties required to-day and find time to do these things as well; though of course if an architect wishes to work with his own hands, and has a tendency that way, he will doubtless produce excellent results, but the idea in buildings of any magnitude or importance seems out of the question. Do not be led astray by theories such as these, but try and gather round you artists and craftsmen in the allied arts, who understand and sympathise with your aims and who will work with you. That is what all our great architects have done and what we should try and do to-day.

The president was followed by Mr. Aston Webb, a former president of the Association, and recently president of the R.I.B.A., who, among other remarks, made the following additions, as reported in the Building News, to the remarks concerning sketching and laying out cities.

In his student days, when they entered a church they looked at the door, took a sketch of the jamb and the arch moulds in order to send a little drawing to the Architectural Association Sketch-book; when they went inside, if there was a screen they took a sketch of the carving and perhaps one or two of the mullions, and generally looked out little bits which would form an easy and useful little sketch. Very often they missed perhaps the whole interest that the church may have possessed, as he was thinking the other day when he was in a west-country church. He noticed, what was to be seen in many west-country churches, that the nave and chancel were of the same height; but, what was not so often the case, the transepts were also the same height, which gave the architect the opportunity of putting a barrel ceiling over the nave and chancel, and also over the transepts, so getting a groin at the intersection over the nave; the arcade was continued straight through to the chancel arch, but the wall was not carried up to the roof, so that one saw the roofs of the transepts over the arcade, giving a delightful and unusual perspective effect. What they wanted to teach students to see and understand was the scheme of the whole thing; the detail was a matter as to which the individual feeling and character of the man who designed the church should be left, to a great extent, unrestrained. Students would learn more from the general design and scheme of the architect of buildings visited rather than in looking at small details—mouldings, carving, and such like. The President had touched on another subject in which he (the speaker) had taken much interest, i.e., the desirability of some control, or some advice, in the laying out of towns and cities—both new and where great alterations are in hand. The subject had been sympathetically received by the present First Commissioner of Works, and it was quite possible that, if the profession supported the idea, that in time something of the kind might be obtained. They all regretted the stage in which the matter of the great new street of the London County Council stood. There was the competition for the selection of a design, the design was selected, but then no further action had been taken upon that. That was a matter of great regret; and, although they all knew that the London County Council were anxious to do the best, he should like to see some expression of opinion among architects that more decisive steps should be taken before it was too late to prevent that great street being built on in the style described in the President's address. During the last two years an important Commission had been sitting in reference to streets and traffic, and, as far as he knew, only one architect had been called to give evidence, and, as far as he could gather, the evidence of that one witness gave more suggestions than nearly all the others put together on the general lay-out of a city. It might be an ideal scheme, but it had the germ of an idea, i.e., radiating roads from London to the suburbs which would, to a great extent, redeem London from that monotony and dulness which the president had so properly objected to. He had always thought it is a most unfortunate thing that the municipal bodies of the cities and towns of England had dispensed more or less with architects as their advisers, and had engaged surveyors instead—absolutely necessary gentlemen in certain work; but, after all, in the formation of new streets, etc., there was something more required than the convenience of traffic and excellence of drainage; there was the question of æsthetic appearance, and the man who could give the best advice on that was the man who had been trained in such matters, and he was, generally speaking, the architect.

TORONTO ARCHITECTURAL EIGHTEEN CLUB.

At the annual meeting of the Toronto Architectural Eighteen Club held on October 11th, the following officers were elected: President, Mr. Henry Sproatt; first vice-president, Mr. E. R. Rolph; second vice-president, Mr. J. C. B. Horwood; third vice-president, Mr. C. D. Lennox; secretary-treasurer, Mr. J. P. Hynes.

STRENGTHENING A RETAINING WALL.

A dry stone retaining wall on the Albula Railway, Switzerland, built in the spring of 1902, gave trouble by slipping and was reinforced in an interesting way. Settlement was anticipated, and so the wall was built a foot higher than the intended level of its top. Several slips occurred during construction, attributed to the water flowing along the surface of the rock, and soon after the wall was finished it was observed to be creeping down and bulging out. In November the top of the wall was rebuilt. It passed the winter well, but the spring thaws and rains caused a renewal of the movement. At the same time the wall bulged badly in places and assumed a stronger batter than it had when built. To give the dry stone wall a secure foothold, as rapidly as possible a number of shafts were sunk down in front of it to reach the rock, and pillars of masonry made in quick-setting cement mortar were built up under the wall base, and also some way up in front of its face, being bonded into it as well as possible, to stiffen it against the bulging tendency. These buttresses of masonry were anchored into the firmer strata of the rock. The work, which had to be carried out with great caution so as to avoid any breakdown of the wall, was done in the course of three weeks, and gave satisfaction, as no further settlement was observed.

NORTHWEST NOTES

THE UNION BANK.

Work on this building, of which an illustration was published in our October number, was commenced on the 17th of October, 1903. 21 concrete caissons used in the construction of the foundation taken down to 40 feet below the sidewalk were used. These caissons average about 5 feet 6 inches in diameter, enlarged to about 12 feet diameter at the base. The steel work was proceeded with during the winter and was completed on the 5th May. The masonry including all brick work, terra cotta, etc., was started on May 14th and was completed on July 16th. From that date the numerous other trades completed their different works and the building was ready for tenants on November 1st. The banking room quarters will be ready shortly.

The building comprises eleven stories and rises to the height of 150 feet above the sidewalk level. The front is constructed of white terra cotta and buff pressed brick. The floors and partitions throughout are built of hollow tile, the floors being finished in maple with quarter cut oak and mahogany trim. All floors for public space in banking rooms, halls and corridors are of marble.

On the ground floor are the banking room and manager's office. The former is 48 x 72 feet in size with 28 feet ceiling. The principal entrance is from Main Street.

The windows in left wall and in west wall which faces Leland Hotel, have metal frames filled with wired glass.

The building is equipped with three fast elevators and is heated with steam, with vacuum air system for radiators.

Messrs. Darling, Pearson and Over were the architects and the Thompson-Starret Co., of New York, the general contractors.

WINNIPEG BUILDERS' EXCHANGE.

The Winnipeg Builders' Exchange held its annual meeting on the 8th inst., which proved to be a well attended and successful one. The Exchange continues to prove its usefulness and find favour amongst the building fraternity of the city. Seven new names were added to the roll of members.

At this meeting many matters of interest were considered and important business for the Exchange to deal with during the coming winter was broached by the president. During the long winter evenings it was felt that the social side of the Exchange should receive more attention, without detracting in any way from its primary function of a business organization. The remarkable success in this direction of some of the exchanges to the south of the line was adduced by several speakers from personal experience. The Property Committee was asked to confer on this matter and to lay some proposals before the Exchange at its next meeting.

Notice of motion was also given that two regular meetings in each month be held in future instead of one as heretofore.

With almost a month of beautiful Indian summer weather the building outlook has improved rapidly for the coming winter. Contractors say the fall has been most favorable for finishing their work, and very few buildings are not roofed in and ready for severe winter weather, should it come suddenly. When once the roof is on the buildings can be kept warm enough for the men to continue their work. Contractors have been rushing their work to reach this point and have succeeded.

On November 1st the new Union Bank building was thrown open to tenants and already the offices are nearly all occupied. The ground floor and first storey are given up to the banking business and its officials. This part of the building is not finished yet but is being pushed as fast as possible. From the third floor to the ninth inclusive is occupied entirely by offices. There are thirteen suites on each floor, these again being divided into different compartments to suit tenants. On the tenth flat are the lavatories, janitor's quarters and rooms for the janitor's staff. All work is finished in hardwood and thoroughly up-to-date throughout.

The new Liberal Club on Portage avenue is rapidly nearing completion. This is a three-storey building with basement. The front is of Redford stone and hydraulic-pressed brick, giving a soft grayish appearance. The ground floor is for the club room. It is 42 x 70 feet and has a large plate glass front with tiled entrance. On the second floor is a large committee room and a number of bachelors' apartments with bathroom in connection. The third floor consists entirely of bachelors' apartments. It is expected to be ready for occupation early in 1905. Mr. J. Chisholm is the architect.

Pilkington Bros., of St. Helens, England, are having a large warehouse built on Market street east. This building will be 100 x 100 feet, four stories and basement. The foundations are being put in but it is undecided as to whether the work will be pushed through the winter or not. S. F. & W. A. Peters are the architects.

Another new building that has just been commenced is the Grundy block, on the corner of Portage avenue and Hargrave street. This block is to be 88 x 130 feet, four stories with basement. It is for stores, offices, etc., and will be carried on during the winter.

The new O'Connor hotel on Notre Dame street east would have been roofed in by now but that it has been decided to add another storey to it, making it five stories. It will contain about seventy-five rooms and be up-to-date in every respect. J. Cadhow is the architect and P. Burnett the contractor for the masonry.

The old Assiniboine block has undergone a great change. It has been remodelled and will now be known as the Empire Hotel. It has a frontage on Main street of 150 feet, which has been filled with large plate glass windows, 6 x 12 feet in size. As rearranged the building will contain about 200 rooms, comprising single rooms and suites, each with a bathroom in connection, and finished throughout in first-class style. A. & W. Melville are the architects for the alterations.

The new theatre is being rushed to completion, as it is the intention to open it by December 5th. This building is being done by Frank McClure, of Chicago, theatre builder. The front is of cement block, manufactured by the Canadian Petrified Stone and Brick Company. The building has the usual balcony, gallery and pit for seating and will hold about 1,200 people.

Work on the Agricultural College has been commenced, but it is not likely that more than the excavating will be done this season.

Plans for the new Normal School on William ave. and Francis street have been prepared by Mr. Hooper, government architect, but nothing will be done this season.

The Land Titles offices and the Carnegie library are both roofed in and the inside work is being pushed.

The work on the new C.P.R. station has been pushed very vigorously and the station part, baggage rooms and offices, are expected to be ready for occupation by the first of the year. These buildings will be four stories high with a basement. A temporary roof has been arranged so that the lower portion for offices can be finished and the staff take possession, as the old building has to come down. Most of the plastering has been done, no lathing being required, as a plaster board has been used and the rough and smooth plaster put onto this. The radiators have been arranged in a temporary fashion so that steam may be turned on when necessary. The hotel proper is not so far advanced, but already the foundation walls have been built, the concrete bases for the steel pillars laid and a number of the pillars placed. The hotel is to be a seven-storey building with about 350 rooms, and will be the largest and most complete and up-to-date hotel in the West.

This month the Main street subway was opened to foot passengers and hundreds of people traversed it to see the work. By December 1st it is expected that the whole street will be opened and the street cars running through to the north end. This is a very fine piece of work, and, although to the eye it appears to be all concrete work, in reality there is enough steel and iron worked into it to almost carry the whole strain of traffic from the the cars. Steel trusses are run parallel with and under all the tracks, and these again are supported by iron rods running into

the concrete pillars and platforms to carry the strains from the arches. The concrete pillars have steel and iron trusses running through perpendicularly. They are built on cement and concrete piles. Cover, foundation and all the arches and pillars are held by a network of steel and iron bars. The sewer pipes, etc., in the street were all removed from the centre and re-laid on either side and the platforms and subway are thoroughly drained. Pipes carry the drainage into the Point Douglas sewer and this sewer is again drained through under the hotel into the higher sewer on Fonseca street, so that there is no danger of water backing up in the spring. The subway in the daytime is lighted by twelve sky-lights in the arches, fitted with prism glass; at night, by electric lights at the intersection of each arch. There will be 38 lights, controlled by a time-switch arranged to light up at any desired time and to run one week without being attended to. The street car track has 18 inches of concrete beneath it, and the balance of the road about six inches, surmounted with cedar block pavement.

The Bell Telephone Company's new addition on Portage ave. east has been roofed in and inside work will be done as soon as possible. When the present alterations and additions are completed the Winnipeg Telephone Exchange will have a capacity of 10,000 customers. New switchboards are to be put in as soon as the building is ready to receive them.

Quite a large number of fine residences have been built in Winnipeg this season; some costing $50,000, and quite a number ranging from $15,000 to $30,000. From time to time we hope to be able to print illustrations of a number of these houses.

The J. H. Ashdown Company, Limited, have commenced to rebuild now they have got the rubbish cleared away after the fire of last month. They intend putting up a fine retail store, but all the plans are not completed yet.

Bullman Bros., whose new block was destroyed by fire last month, have already got into their new premises—a large frame building, 100 x 120 feet, on McDermott ave. Mr. J. Bullman undertook the planning and rebuilding, and everything was done by day-labor. They intend making their own power for electric light and will run all their machinery by electricity.

The Portland Cement Company, of Manitoba, have received letters patent to manufacture Portland cement. The company is capitalized at $1,000,000. Head offices will be in Winnipeg and works at Springfield. They will have two units of machinery in operation in 1905 and will install another four units later, making a 1,000 barrel mill. The cement marl is said to be of a very high quality, and as this material is now being used for so many purposes in the building line, no doubt the company will find a large market for it through the West and will be able to put it upon the market at a reasonable figure as it is being manufactured right at the door of Winnipeg and the West, as it were.

Herbert H. New, architect, has removed his office from Main street to 928 Union Bank.

G. H. Archibald, C.E., has removed from the Merchants Bank to 820 Union Bank

Herbert R. Rugh has removed his office from 367 Main street to 927 Union Bank.

BUILT ALL IN A DAY.

The unusual feat of building a five-room cottage, including foundation, plastering and putting on one coat of paint, in a day of 10 hours, with a cost to the owner of nothing more than a chicken dinner for the workmen, outside of the material, was performed in the little hamlet of Maple Grove, near Evansville, Ind. The man for whom the cottage was built is Homer Rose, and the men who did him the kindness were fellow-employes. The work was superintended by Dee Bacher, a contracting carpenter.

Mr. Rose had had lumber and other material on the ground for months. After these were bought he discovered that he could not go on with his house for lack of means. Mr. Bacher called his men around him one evening and asked for volunteers for one day to build the Rose cottage. Many thought it would be impossible to build it in one workday, but the contractor declared that he could accomplish the feat if the men in his employ would do the work. Twenty-six carpenters, masons and painters agreed to give one day if Mr. Rose would furnish a chicken dinner, and a time was fixed when all should report at the site of the proposed building.

Every man appeared on time. The brick-masons went to work laying the foundation, while the carpenters busied themselves in cutting the joists, studding and sills. Every man was assigned to a particular part of the work, and the house began to go up in a rush. Hundreds of persons gathered about and watched the workmen. Each of the latter urged his fellows on, and when noon came the frame work was all up and the chimney had been started.

Then came the dinner. Mrs. Rose, assisted by some of her neighbors, had fried two dozen chickens. There were 10 loaves of bread, four dozen ears of boiled corn, nearly a bushel of mashed potatoes and bowl after bowl of gravy. The dessert consisted of peach cobbler and various kinds of pies. The contractor had to call off his men for fear that they would eat so much that they would not be able to finish the job.

As soon as the frames were set for the windows and doors the sashes were fitted and the lights put in. By this time, however, the laths had been put on inside, and the sheeting and weatherboarding were being placed on the outside, and the chimney was being run up by the masons, all at the same time. Before the roof was on the plasterers were at work, and exactly at 6 o'clock the cottage was finished, all but the second coat of paint and the skim coat of plaster, neither of which could be put on before the first coat had dried.

Mr. Bacher complimented his men when the job was complete. He said that while he had done some "hurry" work in his time, he had never known a house to be begun and completed in a day. The cottage contains five well-lighted rooms and a large attic. Everything, even to putting on the hinges and locks, was done before the men were called off at 6 o'clock, and Mr. Bacher declares that he could have completed the work an hour earlier had not the men eaten so freely at dinner.—Architects Builders Journal.

DYNAMITE IN GREAT FIRES.

When all other means have failed to check the progress of an extensive and destructive fire it has always been the custom to demolish buildings in its path, in order to deprive it of fuel. Of late dynamite has been used for this purpose, but we are now told by an editorial writer in Engineering News that, as a result of experience in the Baltimore and Toronto fires, this means of checking the spread of conflagrations will probably occupy a less prominent position in the future, as it is apparently not only useless, but positively dangerous. Says the writer:

"In both cities the effect of the explosions on the ruined buildings was simply to produce a heap of wreckage which could not be mounted by the firemen, and which was scarcely less combustible than the original building, while the gap placed in the path of the flames was so narrow that it was easily leaped by the fire. The effect on the surrounding buildings, which it was the purpose of the explosion to protect, was to smash in the windows and thus destroy the only barrier that existed against the immediate penetration of the flames to the interior combustible finish and contents. In the case of some of the fireproof buildings at Baltimore there seems reason to believe that a considerable part of the damages to the walls and to the structural fireproofing was caused by the violent shocks produced in dynamiting adjacent structures. However this may be, it is certain that in many cases the dynamiting was delayed until the 'mined' building was ablaze, with the very natural result that burning brands and debris were actually hurled through broken window openings into neighboring buildings. Such happenings as this are, of course, chargeable solely to unwise direction of the work, but they are certain to occur in the excitement and panic of a losing battle against a conflagration. At best, dynamiting is a dangerous and uncertain means of fighting fire unless it has been much maligned by the experience at Baltimore and Toronto, and heads of fire departments will act wisely if they strike it off their lists of fire-fighting methods."—Architects & Builders Journal.

A Croydon builder was recently fined £2 and costs for using bats instead of bricks for the walls of two houses. In one case there were eleven whole bricks where there should have been sixty, and in another piece of work there were forty-eight bats to one stretcher.

The great man is the man who can see how things are going. How far he is also a successful man in his own generation depends upon how far he sees how things are going in his own generation. To know what will happen is no doubt great, but it is sometimes even greater to know what is happening.

SUGGESTIONS FROM NEW ZEALAND ON THEATRE PLANNING.*

The following is an abstract of a paper read by Mr. S. Hurst Seager, architect, of Christ Church, New Zealand, at the Australasian Science Congress held in January last at Dunedin. The abstract of the paper was forwarded to us along with the accompanying diagrams. The paper had special reference to the provision of exits and escapes at theatres and places of amusement. No more important problem presented

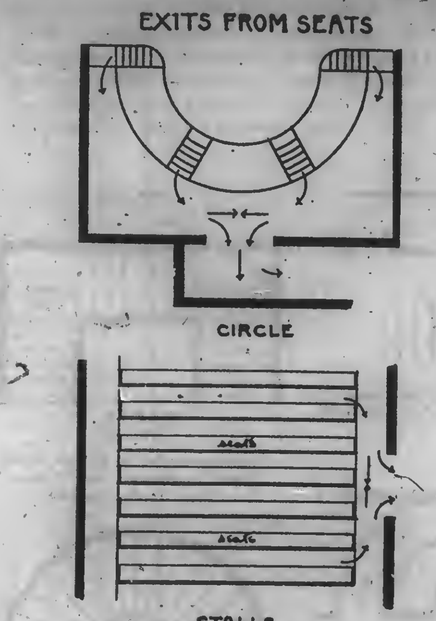


Fig. 1.

itself to the artchitect, said Mr. Seager, than this, yet there was none which he had less successfully solved. The problem was not to design a building in such a way that a an audience might leave it without discomfort under ordinary circumttances, but to design one which would be free from danger in times of panic, arising either from alarm of fire, earthquake, or other cause. It had to be borne in mind very clearly that the problem was not to be solved by demanding on the part of the audience a certain course of action under any unusual circumstances, for at that time they were incapable of thought and incapable of determining what action to take. The problem therefore was to plan a building which should be so arranged that without choice irresponsible people would be compelled to move in a certain direction, and that that direction should be absolutely free from all resistance. Without resistance there could be no pressure; without pressure there could be no danger. It was the neglect of this fundamental principle which had been the cause of such sad loss of life in the past, and its continued neglect would be responsible for all that took place in the future. The first impulse of most of the audience at the time of imagined danger was to rush from their seats towards the entrance from which they approached (see Fig. 1). That at once made it perfectly clear that the usual entrance must in all cases be the exit, and safety did not depend at all upon any number of so-called special "escape doors." These were simple delusions, and should not be provided. There must be entrances, carefully calculated as to number and width, leading to different parts of the building, to be used both as entrance and exits for that part only, and the greatest care should be taken that each entrance should give uninterrupted communication between that portion of the building for which it was designed and the open street. It could not be too firmly insisted upon that there must never be any connexion whatever between one corridor of communication and another. Each entrance and exit should be perfectly independent of all others. To carry this principle out fully every building of entertainment should stand wholly detached with sufficient space round it to prevent any chance of blocking. Very many Continental theatres were so placed, and most decidedly no new building should be licensed which had not a perfectly free, even space on at least three sides.

These spaces should be kept free during a performance. Carriages should always be drawn up sufficiently far away to allow of a free rush of people from the exits, for a very great source of danger existed in allowing carriages to stand on the edge of the pavement directly opposite the only means of egress. Gutters just opposite and steps just outside entrances were also sources of danger which should certainly be got rid of. Special provision should always be made for those using conveyances, so that they could reach them without interfering with the flow of foot traffic or of being inconvenienced by it (Fig. 2). In order to avoid any resistance in passing from the seats to the corridor or doorway, provision should be made so that the streams of people approaching the doorway from different directions could be directed through it without conflict with the opposing streams. This could be affected by means of curved barriers, which he had designed (Figs.

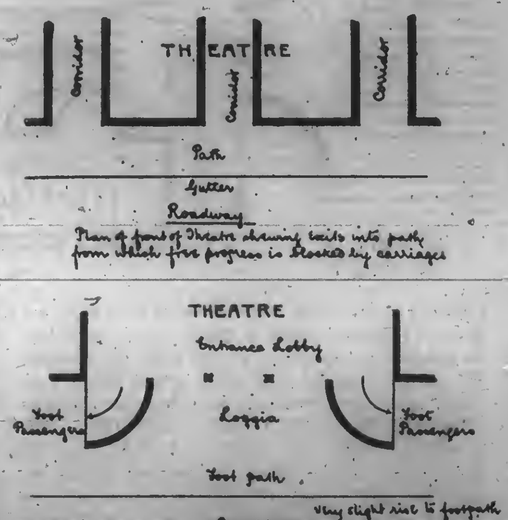


Fig. 2.

*From The Build

3 and 4), arranged so that any pressure exerted by the people behind would force those in front not against other people, but only more quickly out of the building. The seats should always be fixed, and the rows should be a sufficient distance apart to enable persons to walk easily between. Then the corridors should be of even width throughout, perfectly smooth, and any change in direction should be made by curved surfaces. The sum of the widths of the openings into any corridor should not be greater than the width of the corridor itself, and the stream of people entering it through any opening should be prevented by barriers from interfering with the progress of those entering it through other openings, for the greatest danger existed in allowing a stream of people to enter a corridor at right angles to the stream of people already pressing along it. Sliding doors into corridors should never be permitted, but all doors should be hinged to open in such a way that the progress of a stream of people pressing outwards will not be impeded. Staircases should be of even width, and designed with curved surfaces as corridors according to the London County Council rules. The steps should be of equal width throughout, and the flights should be easy, of equal length, and contain no more than eight steps. His own experience led him to the conclusion that easy steps, built in a staircase of even curvature throughout, were much more safe (Fig. 5). Either form might be safely used, but irregular stairs of any kind should be strongly condemned. All stairs and corridors should be of fireproof material. For the walls, steps, floor and ceilings, events had proved it much more essential to safety to scientifically design the entrances and exits that insist on fireproof construction throughout. The lecturer also drew attention to the danger of loose chairs for sitting accommodation, as they impede the traffic in leaving a public place of entertainment. In conclusion he moved :—"That this section of the Australasian Association for the Advancement of Science is of opinion that places of entertainment and public assembly, in order to be considered safe against the dangers arising from panic, must be designed in accordance with the principles here set forth and shown in the accompanying diagram."

It was decided to refer this resolution and the following to the consideration of the General Council :—"That the Architectural and Engineering Section of the Australasian Association for the Advancement of Science, recognising the urgent necessity for the planning of all buildings used as places of entertainment and for public gatherings in such a manner that the safety of the public may be ensured, wishes to bring before municipalities the principles upon which such works should be designed, as embodied in the foregoing resolutions, and would urge that a license be not granted to those buildings which do not fulfil the conditions stated, and that a copy of the above resolutions be forwarded to all Australasian municipalities."

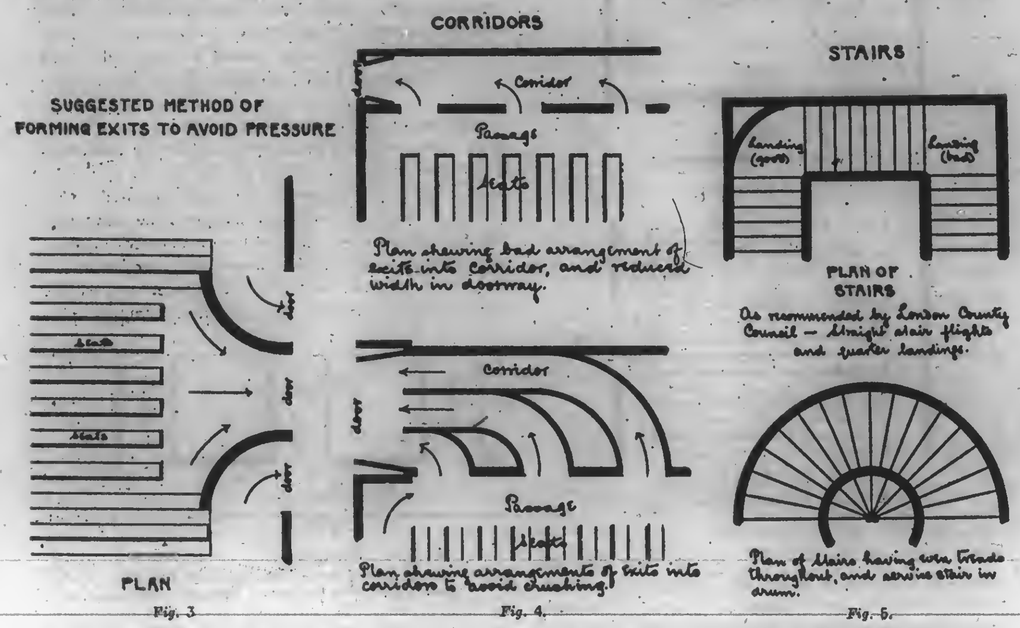


Fig. 3

Fig. 4.

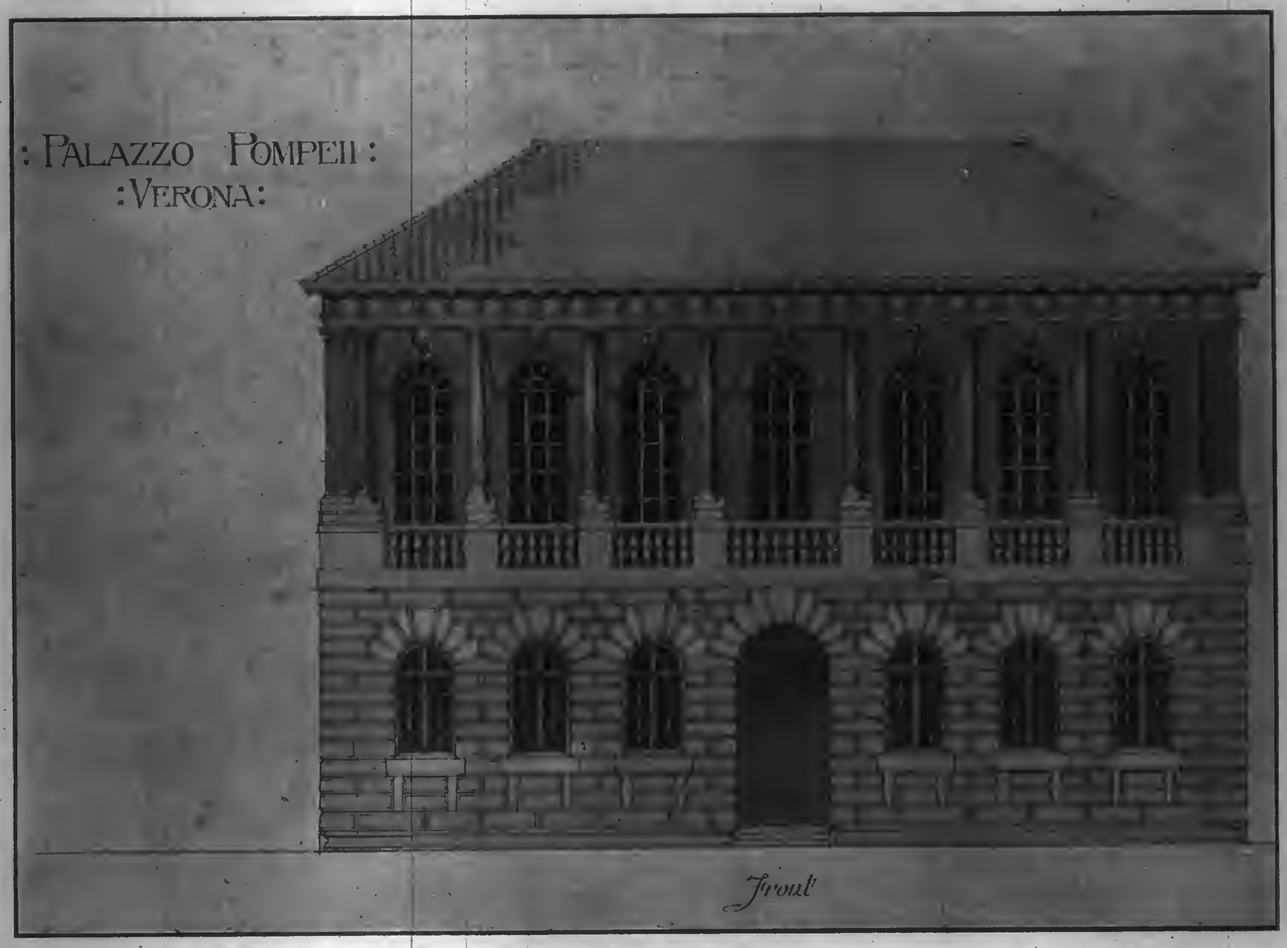
Fig. 5.

THE NORMANDIN CEMENT BLOCK MACHINE.

The hollow cement building block is fast becoming a most popular building material. Every year sees a decided increase in the number of buildings erected in concrete, and the severe fires which we have experienced have done a great deal towards the development of concrete building construction, as it is well known that concrete is to a large extent fireproof.

The Cement Building Block Company, of Winnipeg, report having used and sold over 7,000 barrels of Portland Cement in seven months. They have had five block machines at work constantly in Winnipeg and established over thirty complete block yards through the West this year.

The demand for the Normandin block machine in Ontario has been so great that the Cement Building Block Company has opened a branch office at 42 Yonge Street Arcade, Toronto, where the machine may be seen at any time, also samples of the work done upon it. We are informed by Mr. J. A. Hunter, president of the company, that the Normandin machine is now in use by the United States Government, which should be a sufficient recommendation. The work is neat and of great variety of design and shape. The machine is easily operated by hand. They are made at Walkerville, Ontario, and Jackson, Michigan.

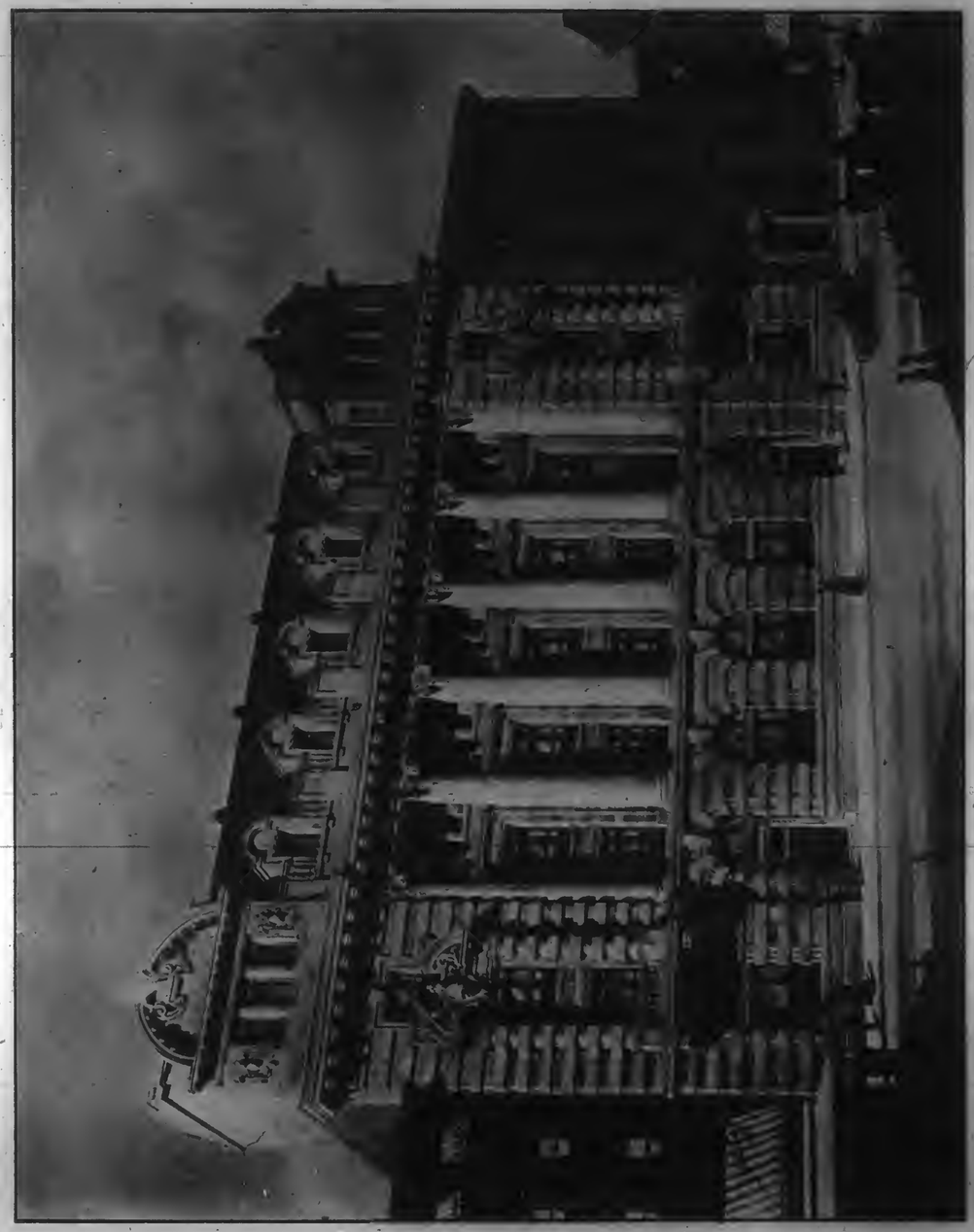


PALACE POMPEII, VERONA.
FROM A MEASURED DRAWING BY CECIL S. BURGESS.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
NOVEMBER, 1904

FIRST CHRISTIAN CHURCH, BATHURST STREET, TORONTO.
S. H. TOWNSEND A.R.C.A., ARCHITECT.

CANADIAN ARCHITECT AND BUILDER.

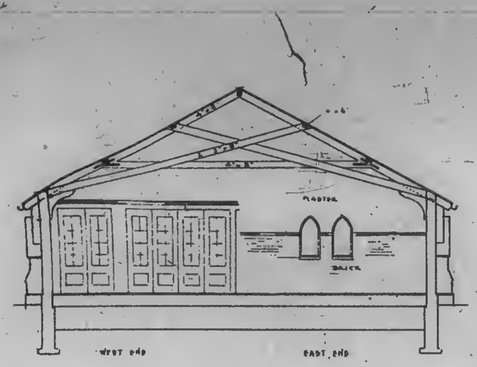


DESIGN FOR NEW POST OFFICE BUILDING AT WINNIPEG.
DARLING, PEARSON & OVER, ARCHITECTS.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
NOVEMBER, 1904

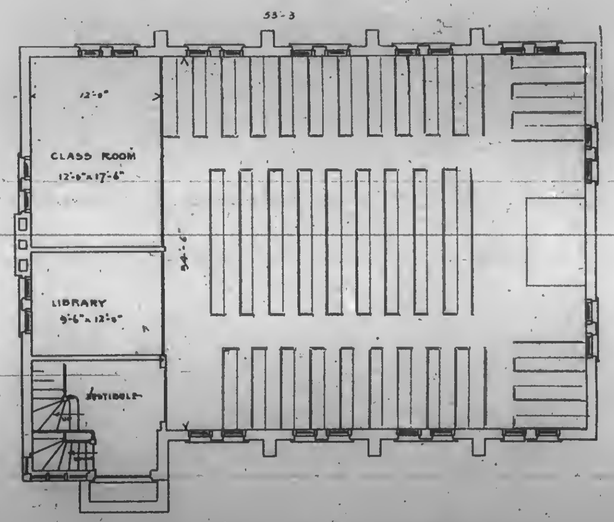
SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
NOVEMBER, 1904

VIEWS OF ST. JAMES CATHEDRAL, TORONTO.
CUMBERLAND & STORM, ARCHITECTS.



SECTION

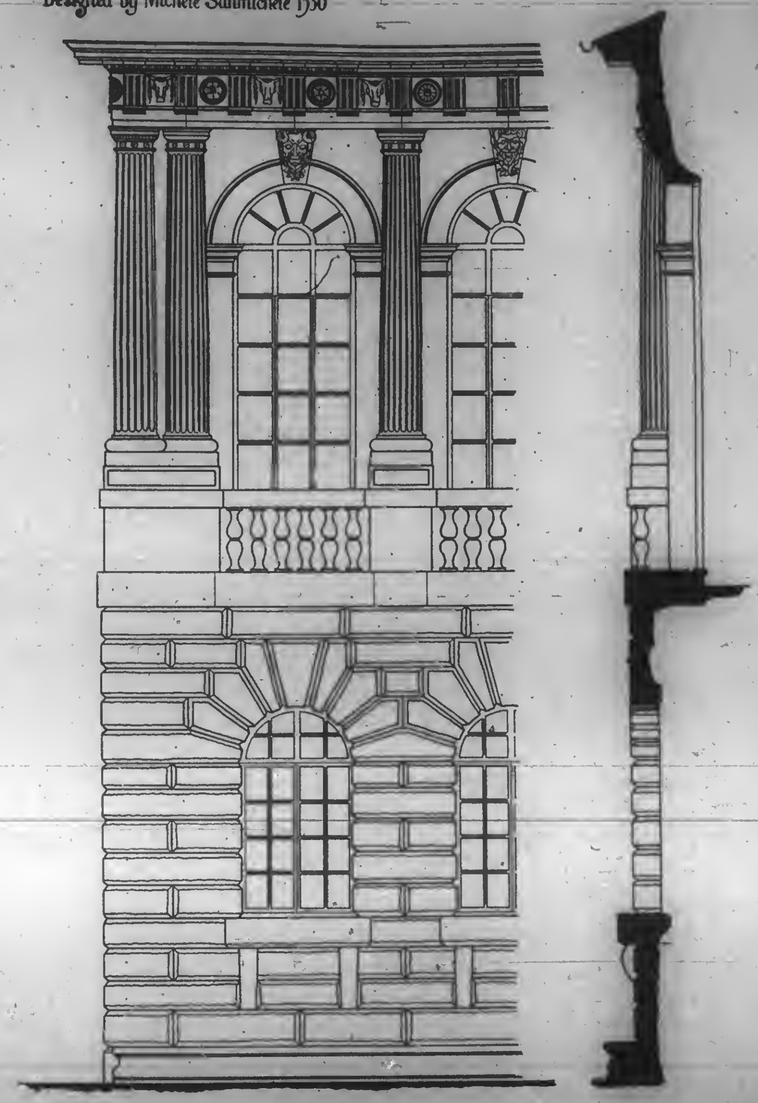
ELEVATION TO THE NORTH.



FIRST CHRISTIAN CHURCH, BATHURST STREET, TORONTO.
S. H. TOWNSEND, A.R.C.A., ARCHITECT.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
NOVEMBER, 1904

PALAZZO POMPEI, VERONA:
Designed by Michele Sanmichele 1530



Elevation Section

Measured & Drawn
Verona, October, 1903
Cecil S Burgess

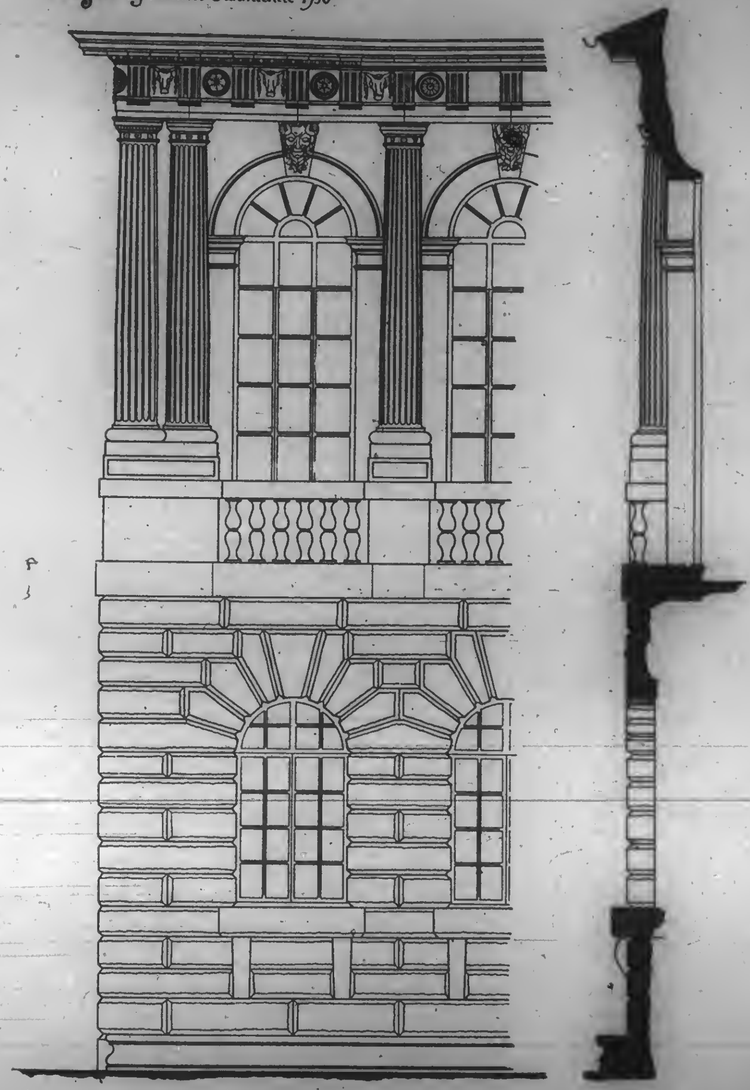
Scale 1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 feet

PALACE POMPEII, VERONA.

MEASURED AND DRAWN BY CECIL S. BURGESS.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
NOVEMBER, 1904

PALAZZO POMPEI, VERONA:
Designed by Michele Sanmichele 1550



PALACE POMPEII, VERONA.

MEASURED AND DRAWN BY CECIL S. BURGESS.

SUPPLEMENT TO
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NOVEMBER, 1904

The Canadian Architect and Builder

VOL. XVII.—NO. 204. DECEMBER, 1904.

ILLUSTRATIONS ON SHEETS.

House in Roxborough Street, Toronto—Messrs. Sproatt & Rolph, Architects.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Santa Croce, Florence—Looking East.
House in New Hampshire.

CONTENTS

Editorial	193	Mr. Joseph Connolly	205
Canadian Pavilion, Liege, Belgium	194	Moving and Erecting Large Granite Columns	205-206
For Thirty Dwellings	194	Legal	207
Practical Lessons from the Baltimore Fire	195-196	Rapid Construction of An Office Building	ix
Our Illustrations	197	Rational Labor Views	x
Review	198	Moving a Brick Office While in Use	x
Correspondence	198	Prismatic Glass	xi
An Engineering Family	199	Strikes in Canada	xi
Affairs in Toronto	200	Publicity for Manufacturers of Building Material and Supplies	xii
Montreal	201	Plate Glass Combine	xiii
The New Peace Palace at the Hague	201	Winnipeg Builders' Exchange	xiv
A Plumbing Exhibit	201	A New Kind of Chimney	xiv
Two Papers on Reinforced Concrete Construction	202-203	In Memory of Soldiers	xv
Ontario Has Marble	204	A New Ventilator	xv

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" W. H. ELLIOTT, Toronto.
" A. F. DUNLOP, R.C.A., Architect, Montreal.
" FRED. T. HODGSON, Architect, Collingwood, Ont.

Sir Aston Webb.

Honours bestowed on the occasion of the King's birthday, last month, included knighthood for Mr. Aston Webb, R. A., the late President of the Royal Institute of British Architects. He makes the fifth Knight in the profession in England. There is also a Baronet.

A Skyline of Tanks.

Toronto, since the fire, has come to the conclusion that there is nothing so satisfactory for the business part of a city as a general use of sprinklers. That is agreed. But how about the tanks which crown the buildings thus equipped. The cooper's art is one of our few surviving handicrafts, and it is right we should exalt it—but abstractly. This elevation of a monstrous vat to roost on every building is grotesque; fine in its way, but not in the way in which the town aims at being fine. If we had mill design as well as mill construction the ensemble would be perfect, but we are in the grip of the Renaissance and must be Renaissance all through. Fortunately, though a Renaissance tank would tax the resources of Vignola, a Renaissance tower is easy, and, if clients require precedent for a tower on their buildings, there is one at home in the Canada Life Building. The low tower which is the making of that building has for its *raison d'etre* the elevation of a water tank to supply pressure to hydraulic elevators. The Canada Life tower was carried out on a scale beyond absolute requirement, but it suggests, on whatever scale, the architectonic solution, for, though, a sky line of tanks is absurd, a sky line of towers would be quite another thing.

Engineers for Fire Chiefs.

One more department of modern life is about to get into the hands of the engineers. The case of the Flett-Lowndes' building in Toronto, where, after the fire which started the sprinklers was extinguished, 20,000 gallons of water were sprinkled on the goods, because the firemen could not find the valves which controlled the service, points to new conditions that have to be met. In the first place the headmen of every district must be (and in fact are) informed of the position of the valves of every automatic service in their district. But they must remember where the valves are, or have a note of it in such form that they can refresh their memory in a moment; and, as the simplest form of note and the most quickly read is a plan, there should be a plan of every automatic system in a given district filed at the district fire-station. And the station-boss should take the plans with him to every call in his own district, to guide not only himself but the chief. Secondly the firemen must be familiar with the mechanism of all such contrivances. At the Flett-Lowndes fire they appear to have wasted time in experiments from want of a clear understanding of the functions of the pipes connected with the sprinkler system. And an insurance man declares that, when h

attempted to explain a system newly installed to some members of the fire-brigade, he could not get them to understand it. So the brigade, or at any rate the bosses, have some new ideas to get hold of; which no doubt they will do by practice. But amid the fire appliances, the preventive appliances, and the construction and mechanical equipment of buildings, the chief wants a good deal of technical knowledge, and public opinion is turning in the direction of an engineering qualification for this office. Among the deductions of Mr, Edwin O. Sachs from the reports on the Baltimore fire (discussed in another column), is "The necessity of officers in charge of fire-brigades having a technical, i.e. either constructional or engineering education of a high standard."

Censorship of Buildings.

Mr. John Belcher, in his opening address as President of the Royal Institute of British Architects, advocates the establishment of public censorship of buildings. He would have the First Commissioner of Works act as a minister of fine art with the aid of an advisory committee, and possess despotic power to decide what may and what may not be done in the treatment of public places and the spaces and buildings around public institutions, in the formation of new thoroughfares and in the question of buildings har monizing with an existing or determined genera scheme. A building act, Mr. Belcher says, can determine heights and so on, but no act of Parliament can define the subtle qualities and delicate *nuances* which make the difference between art and lack of art.

This is very true, and in England it is possible to find not only First Commissioners of cultivated taste but also an advisory committee which may be trusted to be as expert as the expert whose work is in question; so that on the whole there is a greater safety in giving authority to a combination of this sort than in giving free sway to individual indifference or extravagance or even to individual good taste; for a standing commission would be the means of maintaining what is the greatest deficiency in modern streets—unity of style. The greatest thing in a street arcbitect is harmony. A high level of taste in one manner (we are assuming a high level) is better than a jumble of motives, even if here and there (and it would be only here and there) it touched perfection. Mr. Belcher seems to derive support from the United States, where, he says, "some such exercise of authority has been found necessary." If this means the municipal Art Commissions, they hardly go as far as Mr. Belcher proposes, but to judge from some newspaper utterances they are a success as far as they go. Their power is only one of veto, but this is a great power; for no one, whose work has to come before the Commission, wishes to run the chance of crowning his labors with a veto. He does some wholesome vetoing himself as the work progresses. This, which is the process of all good design, is thus forced upon aspirants for municipal work who, before the appointment of an independent commission might have trusted to political influence to carry them through.

Models in Staff.

Anxieties about the result of altering the east front of the Capitol at Washington have drawn from the Mr. W. S. Eames, President of the American Institute of Architects, a suggestion that a full-size model of the proposed alteration should be erected. The cost is estimated at $100,000, and it is thought worth while to go to this expense although the scheme of the architectural committee's advisors, Messrs. Carrère & Hastings, is presented in the form of a model and there is another scheme of which a model is also provided. The contention is that a small size model is so completely grasped by the eye that it may mislead as to the actual effect in the case of a large building or one with a limited range of distance for points of view. All architects, no doubt, meet occasionally with unpleasant surprises in their executed work, but the conditions under which the work is done have much to do with that. In the case of the Capitol the conditions—a complete model to show the design, an existing building to help the eye of the imagination in judging the effect when completed, a stereotyped style which has few surprises for any architect and can have none for the firm advising the committee—all these conditions make so much for certainty in the present case that it gives an emphasis to this public confession of architects (for Mr. Eames fills a representative place) that the only result of the high development of architecture during recent years in the United States is to make the profession tread with fear where an earlier generation went confidently on. It is not a stimulating position. Is it really so impossible to conceive the effect of a design from the usual aids—drawing, modelling to scale, helped occasionally by a full size model of a leading feature set up in place—that we must consider it necessary in work of unusual importance to resort to the study of a full size model of the whole, or at any rate of the whole front? One thing is certain—that however much the frequent use of full size models may increase perfection it is pretty sure to decrease power. To do without such aids is a struggle for the imagination, but it is exercise that makes it strong. The strain to conceive a design "in the round," the practice of visualizing it by the help of other buildings that have little in common with it but similar bulk, the consideration of detail by criticizing existing examples, the study of one's own earlier work in the light of new experience—this habit of brooding over a design, engendered by the very uncertainties it involves, is far more educative and developing than the pottering process of altering a model.

CANADIAN PAVILION AT LIEGE, BELGIUM.

When Hon. Sydney Fisher returns to the Capitol he will decide upon the purchase of a site for the Canadian pavilion which is to be erected at Liege Exposition. Liege is a great centre in Belgium and any display which Canada makes there will be brought prominently before a large consuming population. The cost of Canadian building, including the site, may run to $45,000.

FOR THIRTY DWELLINGS.

The section of land purchased recently by Professor Goldwin Smith, on Gerrard street, east of the Don, as sites for attizans' dwellings, will be handed over to the Artizans' Dwelling Company. The land secured will provide sites for thirty dwellings.

PRACTICAL LESSONS FROM THE BALTIMORE FIRE

At last we have got a report upon the Baltimore fire which is of undoubted value, coming from a disinterested and authoritative source, the British Fire Preventive Committee. This body is publishing a quarterly journal* of which Number 1. is occupied entirely by the special subject of the Baltimore fire. This utterance, which is called a Record of the Baltimore Conflagration is the work of Mr. Edwin O. Sachs, who is the chairman of the five Prevention Committee. It is a compilation from American documents and a summary of his own opinions. The remarkable thing is that out of the enormous crop of published utterances, supplemented apparently by a flood of information, opinions and theories from correspondents in the United States, he has been able to select only three reports that he considered honest. These are :—1. The report of Capt. Sewel, of the Corps of Military Engineers at Washington, which may be called the official report of the U. S. A. Government upon the catastrophe. 2. The Report of the Boston Mutual Experiment Station, called the Insurance Engineering Experiment Station, which is under the direction of Mr. Edward Atkinson, the first mover in the Field of Fire Prevention. The report is by Professor Charles Norton who is in charge of the Station and is approved by Mr. Jos. P. Gray, consulting Engineer. 3. The Report of a Special Committee of the National Fire Protection Association of the United States. Of the rest, some reports are said to be the wilfully distorted accounts of local officials on their defence, of local architects and contractors interested in the various buildings affected, of purveyors of fire-resisting materials desirous of proving the value of their wares, of Commissions and Commissioners with a specific purpose and that in the interest of some party or parties financially concerned in the fire, such as, for instance commissions of the Insurance Companies who had to keep an eye on the reduction of claims made against them and were inclined to take an optimistic view of damage done. Even experts of high standing Mr. Sachs finds are turned into special pleaders by "those far-reaching financial influences that appear to dominate every thing American." "The extraordinary power" he says "of certain sections of the so-called "fire-proofing' trade of America is an extraordinary factor that has to be considered when dealing with the Baltimore fire, for that specialist trade stands in very close relation to the great contracting companies, and these again are in close business relationship with the great financial corporations, insurance, and other institutions that have money to place in real estate, and may thus be said to be directly or indirectly in touch with parties with whom relations would seem very unlikely in this country."

These comments on the nature of most of the conflagration literature explain the smallness of the portion of it that Mr. Sachs has taken for his record. They are also worth noting for the consideration of readers of fireproofing literature in general.

The reports included in the record and Mr. Sach's summary, deduced from his whole studies of the subject, come to conclusions so much in agreement and mutually supplementary that it will be useful to bring these conclusions together under subject heads, first to consider the evidence given of the behaviour of different building materials in the fire, and secondly, to consider more generally how the planning and construction of buildings can be made to contribute to their safety if attacked by fire.

MATERIALS.

Hollow Terra Cotta Tile.—As a protective covering this has proved unsatisfactory in every situation. The principal trouble is that it breaks. It breaks in a heat less than that in which it was baked originally so that this cannot be due to chemical change in the material. The explanation given is the difference of expansion between the part exposed to the fire, (which is constantly called the web in these reports) and that which runs in at right angles to the field of exposure and has one side adjacent to the dead air within the block. The consequence is a rupture at the junction, and the outer web, (the protecting flange) drops off. In the case of column coverings and partitions, the resulting instability appears to be sufficient to destroy the further usefulness of the protective covering and complete its ruin. Good work and good mortar in the first place would greatly increase the stability of this material and its value as a protection. The reports lay emphasis upon the extent of the losses in the Baltimore fire which are really due to bad workmanship.

The cure suggested is greater thickness of the "web". It it is not the material which is at fault so much as its form. The web is now rarely more than 5/8 in. thick and soon gets red hot. Prof. Norton questions "whether any floor, containing so little material on its outer faces as did these hollow blocks, could remain sufficiently cool in this fire to avoid serious injury by expansion." Capt. Sewell suggests that the web should have a minimum thickness of 1½ in. (Mr. Sachs says 2 in.) "So that the entire variation in the temperature would occur within the thickness of the exposed web." Then he thinks "if made porous and "of good clay "the material "would probably he about equal to brickwork."

In the case of floor construction of this material Prof Norton thinks the rupture of the protecting flange is hastened by the constructive form—a segmental arch, expanding on its lower surface and crushing the members of that surface. The National Fire Protection Association give another reason for preferring flat arches to segmental; viz. that the lower face is further removed from the strain-curve of the arch, and the breaking of the lower face will not impair the strength of the arch, as it would if the arch were segmental.

All coverings for the lower flanges of beams and girders appear to have failed under intense heat; flange tiles held by the skew-backs of tile arches broke, as did shoe tiles for girders; sheet metal clips failed; tile which was only held in position by mortar dropped off. In some instances the failure of the shoe-tile also permitted the tile protection to the web plates of the girders to fall off.

The National Fire Protection Association adds to the floor question the following "conclusions" :—"The space between the floor and the floor arch should be filled with concrete of a good quality. It is important common cinders without any cement should not be used for this purpose. It has been found that, due to lack of a hard permanent filling for this space, large safes have fallen a distance of about six inches before striking the arch. This gives them some momentum, which adds to the shock which the arch is called upon to sustain."

Brickwork.—For an efficient fire resisting and protective material it is agreed there is nothing like well burned ordinary brick of good quality not vitrified, and well laid—in cement mortar for perfection. This Capt. Sewell says, will stand the application of both fire and water many times without damage to itself.

The 4 in. brick protection used on exterior columns and also on interior columns was without exception practically intact and as firm as before the fire. This coincides with the experience in former fires. Brickwork combines rigid construction and the necessary fire-resistive qualities.

As an external facing, where the question of appearance is involved, brickwork is not free from chipping; but it is in pressed brick facing that this was most noticeable. As a preventive of spalling, Capt. Sewell recommends round corners.

Prof. Norton found no fault with red bricks but says "where brickwork of a lighter colour, ornamented with terra cotta, was used, considerably more damage was noticeable, especially after the slight snow storms of the week following the fire."

*Journal of the British Fire Prevention Committee, 1 Waterloo Place, London, S. W. Single numbers 5 shillings. Annual subscription for the four numbers of the journal and occasional supplements 16 shillings (post free).

It is essential that brick facings should be properly bonded to the wall with headers. Metal ties and corner brick bonding (American bond) were proved inefficient. Capt. Sewell says "face bricks laid up without other bond than metal ties were stripped bodily from the wall in large areas. This is a new and strong argument against a very prevalent pernicious practice, and it is to be hoped it will be the beginning of the end."

ARCHITECTURAL TERRA COTTA.—Captain Sewell says, "there are records enough of hollow terra-cotta failing under expansion strains when heated. Still, it was thought that architectural terra-cotta was reasonably fire proof when used in external walls. Its behavior in Baltimore is a distinct disappointment, for it can no longer be classed as a fire proof materal." It suffered worse than stone, for while all building stones spalled and chipped "the terra-cotta cracked and fell to pieces, and in some cases its color was changed and the heat seemed to have destroyed its texture so as to render the material soft and friable," and "highly ornamental terra-cotta suffered notably worse than that which was relatively plain." He suggested that "in the case of ornamental terra-cotta, it is possible that filling all the cavities with concrete might improve its fire-resisting qualities by preventing the exposed parts getting so hot as they do when backed by a dead air space, yet I saw some pieces of the Maryland Trust Building which had been filled with mortar, but which failed nevertheless."

STONE.—No building stone can be used for protection against fire. It is unsuitable from this point of view, both for construction and finish.

The exterior stone facing of walls was usually badly broken. Marble and granite are especially susceptible to damage. Interior marble finish was practically all destroyed. Marble not only spalls like granite, though not so badly, but calcines under long continued heat. Capt. Sewell found that stone with projecting parts of any kind suffered more than similar stones entirely flush with the wall. The reason is similar to that which causes the damage to terra-cotta; the projection of parts exposes a relatively small mass of the stone to sudden changes in temperature, while the body of the same stone remains relatively cool. This is true not only of mouldings and other ornament which projects beyond the ashlar face, but of variations in the ashlar face itself; it is the spalled face of the Custom House which furnished him with the text of this part of his discourse, as he found this damage "aggravated by the fact that most of the ashlar was cut with raised panels in the centre."

PLASTER.—The National Fire Protection Association makes the conclusion that "plaster blocks and plaster on metal lath are unsatisfactory for use as a fire-protective covering for columns or other structural metal work."

Plaster blocks, used to protect the columns in the Equitable Building, crumbled away from the columns and fell on the floor.

Plaster on metal lath had been previously found to be unreliable. It is especially susceptible to damage by hose streams. In this fire, Capt. Sewell says, "metal lath and plaster failed everywhere." Yet, though plaster is not sufficient in itself for a fireproof covering it is not without value in a fire. "Applied to other fireproof coverings," Capt. Sewell says, "it will in itself resist fire a long time and thus lessen the severity of the test for the material behind it."

CONCRETE.—All the reports speak well of concrete, though it does not appear in the conclusions of the National Fire Protection Association. Mr. Sachis wants concrete or composite metal and concrete floors in all business premises of the shop, warehouse, and factory class. He will admit terra-cotta for iron protection if nowhere thinner than two inches, and brick for partitions, but mentions concrete first.

Capt. Sewell's opinion is—"Concrete undergoes more or less molecular change in fire; subject to some spalling. Molecular change very slow. Calcined material does not spall off badly except at exposed square corners. Efficiency, on the whole, is high. Preferable to commercial hollow tiles for both floor arches or slabs, and column and girder coverings. In form of reinforced concrete columns, beams, girders, and floor slabs, at least as desirable as steelwork protected with the best commercial hollow tiles. Stone concrete spalls worse than any other kind, because the pieces of stone contain air and moisture cavities, and the contents of these rupture the stone when hot. Gravel is stone that has had most of these cavities eliminated by splitting through them during loug ages of exposure to the weather. It is therefore better for fire-resisting concrete than stone. Broken bricks, broken slag, ashes and clinker all make good fire-resisting concrete. Cinders containing much partly-burned coal are unsafe, because these particles actually burn out and weaken the concrete. Locomotive cinders kill the cement, besides being combustible. On the whole, cinder concrete is safe only when subject to the most rigid and intelligent supervision; when made properly, of proper materials, however, it is doubtful whether even brickwork is much superior to it in fire-resisting qualities, and nothing is superior to it in lightness, other things being equal."

One building in the Baltimore fire, No. 111 E. German Street, which was constructed throughout—columns, beams and floor arches—of reinforced concrete on the Hennebique system, had a severe test, as it was surrounded by non-fireproof buildings. Capt. Sewell reports of this building that in the lower storeys the concrete was absolutely unimpaired, though the contents of the building were all burned out. In the upper storeys where the heat was intense, (Prof. Norton found evidences of temperatures up to the softening point of iron) the concrete was calcined to a depth of ¼ to ¾ in., but it showed no tendency to spall except at exposed corners. The exposed corners of columns and girders were cracked and spalled, showing a tendency to round off to a curve of about 3 in. radius. Capt. Sewell takes from this a hint to round such corners to a radius of 3 in. in the first place, as a preventive of cracking and spalling, saying it would "add much to the resistance" not only of concrete, but "of all materials used in masonry, whether bricks, stone, concrete or terra-cotta—if they are exposed to fire." On wide flat surfaces the calcined material—which was here at the minimum of ¼ inch.—showed no tendency to come off, and Prof. Norton finds in this an additional protection against fire. He says:—"When brick or terra-cotta are heated no chemical action occurs, but when concrete is carried up to about 1000 degrees Fahrenheit its surface becomes decomposed, dehydration occurs and water is driven off. This process takes a relatively great amount of heat. It would take about as much heat to drive the water out of this outer quarter-inch of the concrete partition as it would to raise that quarter-inch to 1000 degrees Fahrenheit. Now a second action begins. After dehydration the concrete is much improved as a non-conductor, and yet through this layer of non-conducting material must pass all the heat to dehydrate and raise the temperature of the layers below, a process which cannot proceed with great speed."

Prof. Norton could find little difference in the action of the fire on stone concrete and on cinder concrete. He considers that the burning of bits of coal in poor cinder concrete is often balanced by the splitting of the stones in the stone concrete. He notes, however, that, owing to its density, stone concrete takes longer to heat through.

(A second article upon this subject will deal with lessons relating to planning and construction.)

A French architect, M. Pénin, who has recently been building on the site of the Hotel Mascani of Paris, an old mansion dated 1678, has nothing good to say of its construction. The floors, he says, sank by their own weight. In general, there was little where there ought to be much, and much where there ought to be little. To this decline, from the perfection of French construction in the Gothic centuries, some clue is given by M. Pénin's account of a flue which was carried of small—and presumably of reduced—girth through the middle of the floor beams. An architectural conception thrust upon the plan instead of proceeding from it falsified construction all through.

OUR ILLUSTRATIONS.

HOUSE IN NEW HAMPSHIRE.

The walls of this house are apparently of brick plastered white. The window shutters are not distinguished in colour, the sash bars carry the same colour across the openings and the roof is either silvered or stained with a silver gray. It is a strong case of simplicity and illustrates its power. There is however a scheme of decoration by climbing plants which owes its value partly to the simplicity of the background and partly to the extension of the trellis over the whole front, in lines which run with the horizontal lines of the openings and are in scale with the building. The nature of the trellis work is seen in the view of the doorway below. Its effect at a little distance, as seen in the general view is much more architectonic than the small diagonal lattice which we are accustomed to see. It adds to the character of the wall; and indeed the inventive designer may see in its apparent unity with the

DOORWAY OF HOUSE IN NEW HAMPSHIRE.

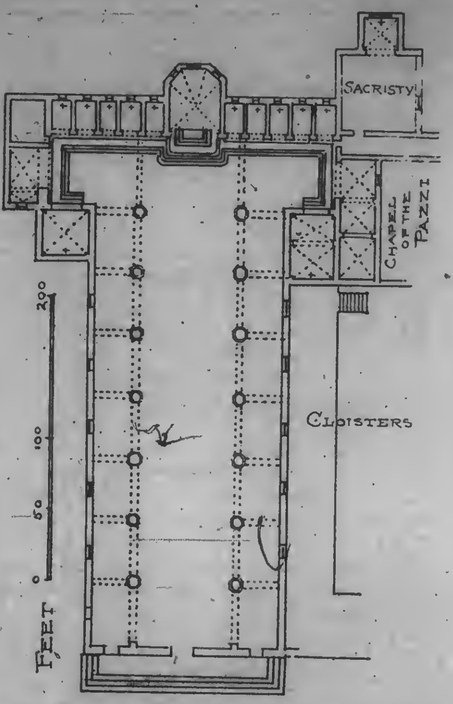
wall a suggestion for enriching the surface of a concrete wall by fillets formed in the course of its erection.

THE CHURCH OF SANTA CROCE, FLORENCE.

The Franciscans, for whom Santa Croce was built by Arnolfo di Lapo, were a preaching order and a poor one. They wanted a big plain church for little money; so that we have in Santa Croce an example of the thirteenth century treatment of a cheap job.

With the exception of the east end, it is as simple as a barn, but is nevertheless the most impressive church in Florence. Size has something to do with it but also the constructional vigour of its design. The nave arcade and aisle arches are 65 feet to the apex, and the plate of the main roof cannot be less than 90 feet above the floor. It is this great roof of king post trusses that is so impressive, partly from its height and partly from the frequency of the principals—about 12 feet on centres. This, in a perspective of 350 feet gives an apparent closeness, which produces a beam effect upon a magnificent scale.

The apse of the east end does not occupy the width of the nave. Its relation is, as suits the T shaped



cross of the plan, rather with the ten chapels, two of which appear with it in the view up the nave shown on on the illustration sheet. It will be noticed that the windows on either side of the apse are not in the same plane; the lower range being at the back of the chapels.

The aisles are roofed by a series of gables pitched from the backs of the aisle arches, which have, therefore, each a valley above. The timbering of these roofs shows within. This arrangement (which even in Italy must require some attention) was made for the sake of strength, and gives, much more than a sloping roof, an appearance of stability to the exterior.

HOUSE ON ROXBOROUGH STREET, TORONTO. — MESSRS. SPROATT AND ROLPH, ARCHITECTS.

The drawings on the illustration sheets are reduced to a scale of 8 feet to an inch. The house faces south. The main construction is simple and rectangular, but the plan is interesting from a variety of effect, due to recessing the windows on the south side, and to a difference of level between the drawing room and the living room, which appears again in the hall in the way of a pair of landings to reach the same level, for access from the hall to the dining room and to the kitchen department, which is, for the purpose of service, on the same level as the dining room. The first characteristic of the plan is, however, spaciousness, without which the variations in level would fail in effect and the recessed windows cease to have their present contrast with plain wall surface. The hall and living room placed end on to one another give the

house as much extension as possible on the south. The smaller size and different disposition of the drawing room make a change which relieves the interior—and also the front—from monotony. The dining room and kitchen arrangement is naturally made as compact as possible. The kitchen is all the better for retreating from the sun behind the front part of the house. In the case of the dining room this retirement is a concession to shade on the verandah; but the dining room is in close and open connection with the living room, where there will be plenty of sun. It is interesting to see a return to the old fashioned vestibule, with external doors which, when not in use, fold back as panelled sides to the recess. The projection of the vestibule into the hall is made to tell on the inside as a pair of recessed windows on the long side of the hall.

REVIEW

We have received a handbook for architects, on Locks and Hardware,* by Henry R. Towne, (President of the Yale & Towne Manufacturing Co.), which contains definite information, such as an architect wants, about locks and other interior fittings, usually called "Builders Hardware" in the United States. It is a general treatise with special illustrations, drawn for the most part from the products of the works under the management of the author. This though a distinct lead in the direction of Yale has less of the nature of a justification of the goods than of that direction to their use and guidance in using them with which we are familiar in the handbooks of the manufacturers of steel beams. The Yale productions are well known and anyone who chooses to take suggestions from this handbook will do so from choice, knowing beforehand the standard of quality and looking only for information as to what will suit his requirements. The information he will find is as follows, divided into ten Parts:—

Part I. History, the development of lock making and "Art Metal Working" in America; chiefly a reprint of articles published at different times; one by Montgomery Schuyler on Artistic Hardware.

Part II. The Mechanics of Hardware. A valuable section, explaining, by the help of illustrations, the construction and mechanical characteristics of locks and other articles. A knowledge of this is essential for a proper selection and application of hardware finish.

Part III. Art Metal Work & Ornament. This consists chiefly of historical studies of all the Schools of Ornament (thirty four of them, beginning with the Cave Dwellers and ending with the Colonial School), by W. W. Kent. There are a great many illustrations showing characteristic examples of the Schools and, when the Yale & Towne Co. have produced hardware in one of these styles, illustrations are appended, with page numbers for their identification in the classified lists given later in the volume. This part concludes with a section on metals and their finishes and one on the obscure subject of the momenclature of the finishes.

Parts IV. to VIII. give Classified Lists of Yale hardware; Locks and Latches, Locks in Sets, Plain Hardware, Hardware Groups and Cabinet Hardware. All articles illustrated from photographs, all priced on a system which gives the relative value of different sets, materials, finishes, etc., and their absolute value near enough for the purpose of a preliminary estimate.

Part IX. Specifications and Forms of Contract.

Part X. Miscellaneous Information; among other things a useful hint about drawing for hardware and some illustrations of different types of casement window construction. There is a glossory of terms, at the beginning of the book, with the motto at the top—"Accuracy in Language promotes Accuracy in Business." The promotion of accuracy is the purpose of the book and constitutes its value.

*Locks and Builders' Hardware, by Henry R. Towne. Profusely illustrated. John Wiley & Sons, 43 to 45 E. Nineteenth Street, New York. $3.00.

CORRESPONDENCE

QUEBEC, December 3, 1904.

Editor CANADIAN ARCHITECT & BUILDER:

Sir,—Among the usual number of pertinent articles in your last issue, I find "Suggestions from New Zealand as to escape from theatres in case of fire or panic."

The suggestions are all excellent; but would prove to be useless after a very short season of probation, as no theatre lessee could ever be made to carry them out on account of the curtailing of his profits by as much as it would cost nightly and yearly to pay men to attend to so many entrances and exits and especially in a climate like this, where, if emergency issues were provided with doors opening outward on to iron landings and stairs the same would have to be attended to night and day after every fall of snow or because of ice and sleet offering an obstacle to the outward opening of the doors.

We have had a terrible example of this in the case of the Paris Charity Bazaar, where, though seven emergency doors had been provided, and were at hand to do the needful; the wealthy promoters of the bazaar would not incur the expense of as many men as doors, with instructions not to leave their posts on any pretence and to throw open the doors immediately on the very or mere suspicion of a fire or panic of any kind.

Had this been done, not a single life would have been lost, though of course the inmates would have been the worse of a singed head and burnt shoulders from the burning and falling draperies from above, but all of which would have been restored, hair regrown, scars have disappeared within a few months after the occurrence.

The most instructive lesson in the way of escape from danger in the case of the burning of a theatre, was admittedly that of the latest Chicago horror, where during the conflagration of a new theatre, more than 700 persons lost their lives.

The commissioners named to report on the cause of the catastrophe, arrived at the conclusions which, had they been arrived at and carried out before the fire occurred, would likely have reduced the fire to one without loss of life and have saved half the edifice, the auditorium side, from destruction.

In this case there was on the auditorium side of the building a large ventilator or opening extending from the auditorium ceiling to and through the roof of the building. This, as its name implies, was for the purpose of ventilation—while over the stage end of the theatre there was no ventilator or opening of any kind. Now, say the commissioners, it is especially on the stage side of the edifice that such an opening should have been provided, extending from the stage ceiling to and through the roof.

The tendency of heated air and gases is, as must be well known, to rise vertically and seek an issue into the atmosphere. The hot air and smoke would thus have no tendency to rush, as it did, towards and into the auditorium through the proscenium arch to gain an exit by the auditorium ventilator.

The proscenium was provided with a fire-proof curtain or screen of asbestos. This curtain was not a rolling one; but slid or moved up and down bodily, its ends being armed with slides which were confined by vertical guides for the purpose.

An attempt was of course made to lower this curtain or screen down to the stage floor, which would have effectually cut off the flames from reaching the auditorium side of the building; but all attempts were unavailable to move the screen further down than to within fourteen feet of the floor of the stage; due to the pressure which the current of heated gases from the stage end, where the fire occurred (and always does occur), pressing the curtain slides so tightly against the outer side or auditorium side of the guides, that no force would move it beyond the point it had reached.

The smoke and hot air therefore having no issue from above the stage, continued to pour through the proscenium arch into the auditorium side of the building where it is probable and consoling to think that the audience were asphyxiated before the flames had time to reach them.

The commissioners insist that had there been over the stage end of the building a proper exit for the heated gases, they would have risen vertically to egress through the same without any tendency to invade the auditorium to seek an exit on that side of the procenium wall or wall of separation between the stage and auditory.

This then, of all the possible solutions of probable escape with one's life from a theatre where the stage is on fire (and there is not the least tendency of the fire starting on the anditorium side of the curtain) the true and only one—independently of all other facilities of exit as recommended by the New Zealand architect—is the existence, above the stage, of such an opening as would allow of the smoke and gases passing out direct into the atmosphere, without any tendency whatever to take any other direction.

Of course the opening in the roof, and especially in such a climate as Canada, must be closed to keep the cold out and prevent loss of heat; but this could easily be managed by topping it with a ridge roof of such an acute angle (say 60° at apex) as to cause snow to fall off it, and the opposite flaps or shutters of which would be worked from the stage floor level of the building by wire ropes or even by hempen ones passing down along the walls through iron conductor tubes to prevent the possibility of the ropes themselves being burned by the burning scenery.

In 1854, when the writer designed the Quebec theatre "Academy of Music," asbestos was, so to say, unknown, and there was to have been a solid screen of iron, for raising which bodily there had been provided sufficient height in the rooting above the stage.

This screen or curtain, to disguise or dissimulate it, was to have been covered with mirror in vertical strips of say 3 to 5 ft. in width held in position by silvered sash base riveted to the body of the screen.

Such a curtain reflecting, when down, the whole audience, would have had a fine effect, and at any rate, of whatever nature, such a cut-fire screen should be at hand in all theatres and a cut-fire wall extending from the very foundations to above roof of building, with no other opening than the proscenium arch, or iron doors to other openings through it, if indispensible.

In conclusion, as any additional precaution can never be "*de trop*" and on this head, it may be remarked that in rebuilding the theatre at Antwerp, Belgium, destroyed by fire some 10 or more years ago, a recommendation made by the writer in a paper of his read before the Society of Architects of Canada in 1888, was carried out, and each of the five tiers of surrounding galleries above dress circle level was provided with exterior iron balconies and some 25 doors or exits, 125 in all, leading thereto with outer iron stairs from each tier down to ground level; this allowing of emptying the building of its inmates in less than half a minute of time; while, of couse, the stage end of the edifice is also amply provided with issues to the same effect.

CHAS. BAILLARGÉ.

Mr. Baillarge's suggestion strikes at the root of the danger in theatres. The difficulty of a large opening which must be kept closed and yet must be thrown open in an instant is no doubt as susceptible of solution by automatic action as is the operation of the ordinary fire door. No matter how heavy the doors of the opening may be, if they are hung on pivots it is but a little weight that would make the difference between the balance that keeps them shut and the balance that throws them open.—ED. CANADIAN ARCHITECT AND BUILDER.

A QUESTION OF FEES.

An Ontario architect writes as follows:

The writer wishes to obtain a recognised schedule in pamphlet or book form of the fees that architects are entitled to for full and partial services as architects. Also wish to ask what is usually understood by the profession as full professional services. Does it mean constant attendance at the building during construction, if not, how often would any representative of the firm be required to visit the works to comply with the term full professional services to their client, in the absence of any special agreement.....A large portion of the proposed scheme was abandoned. Are the architects entitled to collect the usual proportion of fees for plans, specifications, details, surveys and measurements. Also the obtaining of proposals from contractors for the same. In this locality the custom has been to collect 50% of the full fees customary.

Answer.—In reply to your letter of November 24, asking for information about architects fees and services: The only Ontario tariff is that of the Ontario Association of Architects, which we cannot very well procure for you if you are not a member of the Association, and indeed it would be of no service to you unless you are. The only scale of charges recognizable by a court of law in a case of a disputed fee, where there has been no preliminary agreement, is the scale which has been in use by the architect or the body to which he belongs; the presumption being that there was a tacit acceptance by both parties of what is customary in that neighbourhood or known to be the previous custom of the architect. You have a right therefore to claim for your work what you have been accustomed to charge; or, in case of discontinued work, for that proportion of the fee which you have been accustomed to charge for the proportion of the work done. On this head the schedule of the Ontario Association reads: "For partial service or in case of the abandonment or suspension of the work, the charge for partial service is as follows: Preliminary studies, 1-5 of the full commission. Preliminary studies and general drawings and specifications sufficient for estimate and contract, 1-2 of the full commission. Preliminary studies, general drawings, specifications and details, 4-5 of the full commission. For superintendence alone, 2-5 of the full commission for the work to be superintended." This is generally considered to divide the fee into parts fairly proportionate to the amount of work set off against each part.

As to superintendence there is no way of measuring it except by efficiency. The intention in superintendence is to see that a work is being carried out in conformity with the design, specifications and directions, so that the work is as suitable for its purpose as it was intended to be; and to watch its progress with a view to certifying correctly the payments that are due as the work progresses. The architect, in the absence of a more definite arrangement, is supposed to judge for himself when and how often visits should be made for these purposes, and the only proof of his neglect will be in results.

A QUESTION ABOUT VENTILATION.

A correspondent asks for information as to recent methods of ventilation:

Answer.—A reply to your request for information as to recent methods of ventilation is a matter far beyond the scope of a letter. There can hardly be said to be new methods, only new contrivances for carrying out the one old and only method—the application of power to move the air. Of these contrivances the simplest is heat, and, inasmuch as ventilation is usually required during the winter months, the application of heat is within the compass of everybody building in this country. Ventilation and heating should be studied together as one scheme, calculated in mutual relation; but this requires science, and to that end study, for which purpose an excellent book is Heating and Ventilation by Professor Carpenter of Cornell University. It is published by John Wiley & Sons, New York, and the catalogue price is $4.00.

AN ENGINEERING FAMILY.

The City of Quebec has appointed Mr. W. D. Baillargé to the office of City Engineer; the place his father, Mr. Charles Baillargé, filled, with so much distinction, for 33 years.

The United States Government through the Bureau of Foresty is carrying on some interesting experiments in order to determine the rate at which different kinds of timber will season. Certain kinds of timber, it is known, are improved by being soaked in water for different periods of time, but the chemical or physical changes which occur are not fully understood, with the result that the best economic usage of timber is largely a matter of accident. The enquiry referred to may prove highly valuable in discovering means for the arrest of decay, the best utilization of certain parts of the tree, and so forth.

AFFAIRS IN TORONTO.

THE site of the new building for the Toronto Public Library is not settled. As far as users are concerned, there seems to be good arguments for both down-town and up-town sites; but the balance is in favour of an up-town site for the permanent and valuable part of the library, which will be used by students, and a lending branch in the city. The site chosen is the Perkins estate on College street, where the building will be in close association with the university group and on a thoroughfare which, from this association and from other accidents in its course, has more possibilities for the creation of beauty than is usual in the streets of Toronto. It is impossible, however, from the point of view of advantage to the neighbourhood in which the building is placed, not to regret the loss of an occasion given, if the site adjacent to the City Hall had been found desirable, to make the proposition include the whole block of land between the City Hall and Osgoode Hall. The argument would have been that, if we house valuable books and unique documents in the middle of a great-risk fire district, the building that contains them should be isolated; the result would have been the redemption of that part of Queen Street.

THE air of Toronto is heavy with building projects. The Union station is an actuality. Messrs. Darling & Pearson, E. J. Lennox and A. H. Chapman, (the latter associated, for this purpose, with Messrs. Sproatt & Rolph) are understood to be retained as competitors for the new building, if they are not as yet actually engaged upon it. Its erection will mean the transformation of Front street between Yonge and York streets.

THE EXHIBITION BOARD will soon be applying for a grant from the city. They are talking of new buildings. There was also some mention of a plan of the grounds, but not in the same breath; not at any rate with the same amount of breath. If, however, their request for a grant is to be supported by anything definite, it should include a definite plan of the grounds. The success of the Exhibition appears to be such as to justify the City Council in taking a hand in its extension and improvement, but, though the money given is given for building, the value of the buildings, as a means of making the Fair attractive, depends so much upon their disposition upon the grounds that it is a plan of the grounds that chiefly concerns the custodians of the public purse.

THE UNIVERSITY is about to begin the Convocation Hall, for which plans have been prepared for some time, and the Ontario Government will expend, on a new building for the department of Physics, the $180,000 received from the Grand Trunk Railway as the purchase price for the old Parliament Buildings on Front street. It is understood that the position of this building in relation to the other University buildings has already been considered. If it is anywhere within grouping distance of the main building, it is to be hoped that it will fulfil the obligation—difficult, but possible—of harmony without imitation. The great want in the University set of buildings is of a plain type that will harmonize with the ornate main building. This has been done at Columbia. The scientific buildings are machine shops and the library is a monument, but they harmonize.

A UNIVERSITY RESIDENCE is being talked of. Mr. E. C. Whitney, of Ottawa, has given, to the trustees of the University, $15,000 to be the nucleus of such a residence. A good deal more will have to be got before anything can be done, but the sum ultimately aimed at need not all be got at once. A good suggestion was made, in the newspaper account of the presentation of the gift, that the proposed residence should be a composition of units which could be built separately; the whole when completed enclosing a quadrangle. Each house would hold fifty or sixty men who would be under the general direction of a member of the faculty in charge of the house. University men are, like other men, bnt children of a larger growth, and the growth is not only less large but comes upon them rather suddenly, when they leave the restraints of school for a freedom such as they never had before, nor indeed, it may be said, are likely ever to have again. Personal influence of the right kind is even more important than rule in making the most of the double opportunity—the opportunity for studious seclusion, and, at the same time, for constant association with equal minds—which makes the charm and is the advantage of college residence life. And this influence is most effective where the field is not too large. Houses for 50 or 60 making the sides of a common central space, quadrangular or otherwise, would make an excellent system of formation for a residence or a series of residences at the University. It can be built, a unit at a time, as funds come in. If the University had succeeded in selling its land to the north of Hoskin avenue it might now have the funds for such a residence but it would not have the land. Now, in consequence of that fortunate failure, it has the land and, as the province is on the bound, there may be, now or soon, other people who have the funds.

THE HOUSING QUESTION has, with the approach of winter, become more acutely felt to be a serious matter. Inconvenience is felt by all classes, but the poor are suffering. It is an expensive matter for a whole family to board. Poor people must have a domicile of some kind, and the shifts they have been put to are sometimes startling. Homes are made in stables, sheds, old street cars, tar-paper shacks, etc.; all duly visited by a local reporter with the freedom of a friend of the family; and the willingness shown, by those he visited, to talk about their affairs is a symptom of the strain they are feeling. The occasion has roused Mr. Goldwin Smith to try to organize a joint-stock company to build workmen's houses and rent them on the basis of a fair profit for the capital invested. This is a large-minded and truly philanthropic scheme. To apply money where the public good requires it, and, while asking for a fair profit, to ask for nothing more, is a conception of the use of capital, which, if it obtained generally, would bring about happiness on the earth without failure and without delay. It is to be hoped that this scheme will work without failure, and also—as the need for it is pressing—without delay.

MONTREAL.

THE YEARS CHANGES IN THE CITY.

Of city buildings which are likely permanently to enhance or detract from the beauty of the town, the greatest number during the past year has been erected in St. James street. There the banks congregate and it is these institutions which have easily held the lead in building operations not only by the number and extent but also by the costly and substantial character of their enterprises. As a rule too they have set excellent examples in erecting buildings of good fireproof character—the system of cased steel work with flat terra cotta arching for the floors being adhered to in almost every instance.

The 'armed cement' construction usually adopted for the roof of this class of buildings suggests the favorite French method of fireproofing; but though now being advertised here we do not know of any examples where a "beton armé" system has been thoroughly applied in Canada. Apart from banks, we still see too many commercial buildings being built with little or no attempt at fireproofing. That this should be done by private firms is not, perhaps, very suprising, but it is wholly so to find the new wing of the law courts setting the example of wooden joisted floors at this time of day.

We have formerly spoken at some length about the head office of the Bank of Montreal—easily the first in architectural merit of all the buildings in the city. The works which have been in progress there are now nearing completion and the 87th annual meeting of the bank was held in its new chambers on the 5th December.

Of the other banks in St. James Street, the Bank of Ottawa building nearly completed and that of the Sovereign Bank, now hastening to get its steel skeleton clothed in more comfortable materials, both have soared to the full height permissible by the city bye-laws. Both belong to a type of design derived from the high buildings of American cities. That is to say, they endeavor to present a building of extremely high narrow proportion and to preserve unity of effect by strongly emphasing a storey or two at the bottom to provide an architectural base, again strongly modelling the top as a crowning member, leaving the intermediate storeys plain as a contrasting body. These are from the designs of Mr. H. C. Stone.

On the opposite side of the street the Metropolitan Bank designed by Messrs. Finley & Spence shows on a smaller scale a similar general treatment and it is here very palpable that the smaller bulk bringing the whole building more within the compass of the eye is more suited to carry a scale of detail which can be refined without losing strength and interest.

For the Imperial Bank, the large building at the south end of Victoria Square, which was gutted by fire a couple of years ago, has been remodelled under the direction of Mr. A. T. Taylor, whose departure for England makes an important change in the ranks of the Architects of Montreal.

The Royal Bank of Canada's new building in St. Catharine Street and also the small branch of the Bank of Montreal in Greene Avenue close by were referred to last month. Farther east in St. Catharine Street, Mr. A. H. Lapierre has erected a three storey building of Quebec limestone for the City and District Savings Bank, the exterior of which is now completed.

Outside of St. James Street, the "down town" streets present few important changes. A new building is now being erected at the corner of Notre Dame Street and Cote St. Lambert—the result of expropriation changes. The principal improvement in Craig Street has been the recent thinning of the forest of telegraph poles, which helps to make that locality so picturesque. Some of the finest giants have lately been felled in pursuance, we understand, of the intention to have the wires generally placed underground.

As regards stores nothing of first-class importance has been carried out during 1904. Perhaps the greatest number of new works of this class is in St. Catharine Street. W. H. Scroggie Limited have completed the structural work of an addition to their store which, if not rising to architectual magnificence, at least completes the block from street to street in a uniform and tidy manner. The Renouf building, almost opposite, was completed early in the year, and in Union Avenue, not many yards away, a new store built and elaborately finished for a fashionable tailor exhibits much careful ingenuity of design.

In some of these buildings one may observe a rather plensant introduction of delicately modelled broad metal frames around the store windows. If this treatment does not compensate for the architectural defect inherent in the slenderness of support that shopkeepers demand, it has, at any rate, the merit of giving interest and emphasizing the metallic nature of the supports.

In St. Denis street, not far from the corner of St. Catherine street, the Polytechnic School has recently been completed. This excellent building, from the office of Mr. E. Vanier, is one that has an agreeable air of appropriateness to its purpose. Designed without undue ambition its well understood and wholesome detail raises it well above the commonplace.

The building for the McGill Young Men's Christian Association in Sherbrooke street has now almost attained its full height and the Montreal Amateur Athletic Association premises in Peel street, referred to in a previous issue, are being completed internally. At a similar stage, or rather less advanced, is the new Maternity hospital at the corner of St. Urbain and Prince Arthur streets.

Of dwellings large numbers have been built during the year, mostly of a humble class in the poorer outskirts. A striking feature in the better localities is the number of apartment houses which have appeared; some of them new, but many the result of a transformation of private dwellings which have been swelled out in all their dimensions to contain as many apartments as possible. In these it need hardly be said the money making purpose is more obvious than the architectural excellence. They are, however, eloquent witnesses to a particular feature in the life of the citizens. Montreal becomes more and more markedly a city where one half of the population makes its living by keeping house for the other half, and the people with a private home life of their own are becoming a smaller and smaller proportion of the whole.

For next season's operations they are now getting in the foundations for a large hardware store in Bleury street, near Craig street, Mr. H. C. Stone being the architect, and a new seven-storey fireproof store is advertised as about to take the place of some of the older buildings on the south side of St. Catherine street, a little west of Peel street. The McGill Students' Union building and the new club house of the Mount Royal Club, both in Sherbrooke street, give signs of being prepared to spring up with the coming of spring. Next year should also see substantial progress made with the new Notre Dame hospital and the Fever hospital at Point St. Charles. The erection of the latter has been delayed, we understand, owing to certain preliminary financial difficulties.

CONCORDIA SALUS.

THE NEW PEACE PALACE AT THE HAGUE.

Every one who has visited Brussels, the beautiful capital of Belgium, will remember the splendid pile of the Palace of Justice which forms such a striking feature in the modern architecture of that city. That building has been decided upon as the model for the new Peace Palace at The Hague, which is to be erected through the gift of Mr. Andrew Carnegie, and which, on a smaller scale, will be exactly similar to it. The new palace will cost $1,640,000, and will be a superbly beautiful building. The main audience-room, where the sessions of the Court of Arbitration will be held, will be 270 feet long by 120 feet wide, and will cover no less than 12,000 square feet in area. In addition, there will be a committee room, and on the second floor two spacious rooms, one for the president and the other for the secretary of the permanent Court of Arbitration. The dome surmounting the palace will be supported by two galleries, the lower square shaped, the upper, round, flanked by great bronze statues of Clemency, Justice, Law and Strength.

A PLUMBING EXHIBIT.

PROVINCIAL BOARD OF HEALTH PLANS UNIQUE DEMONSTRATION

The Provincial Board of Health is providing space for an exhibition of specimens of plumbing work and fixtures, ancient and modern, to demonstrate in a practical way the great advance which has been made in the manufacture and installation of the same. Mr. M. J. Quinn, for twenty years mechanical superintendent of the Public Works Department, is making the collection for the board. The specimens will not only be exhibited, but lectures and practical talks will be given to all interested, with a view to implanting and cultivating a correct idea of the intimate relations between proper hygienic conditions and sanitary plumbing.

TWO PAPERS ON REINFORCED CONCRETE CONSTRUCTION.

These papers were read at a regular meeting of the Royal Institute of British Architects on November 21 last.

The first paper, by Mr. William Dunn was as follows:—

CONSTRUCTION AND STRENGTH OF REINFORCED CONCRETE.

Owing to many unpleasant experiences, there was, he remarked, a feeling among many architects and builders that concrete was a treacherous and unreliable material. In all such experiences there was something mysterious; the cement came from a maker of established repute, it had been specified "Best London" Portland cement, the sand and gravel looked clean, and the builder was an honest man. Nevertheless, it failed to set, it cracked, it thrust out the walls, and generally led to a great deal of trouble. To make good concrete much care in the selection of the materials and in the mixing was required. The cement was the most important ingredient, and the only way to get good cement was to constantly test it and reject that which was faulty. If the fact that it is frequently tested becomes known to the merchants, it will be found that bad cement would be less and less frequently sent. When floors, walls, roofs, or pillars are made of concrete, a bad cement is really dangerous to life. It would be an excellent plan if the Institute, the Builders' Institute, and the cement makers could agree upon a standard suitable for architectural work. But until such a standard was fixed, architects must describe it themselves in their specification. Many cement experts had given model specifications, but there are some points in cement specification required for building work which a cement expert scarcely values.

FINENESS OF GRINDING

Is all important, as only the very fine particles have cementitious value. Foreign makers were much ahead of us a year or two ago; now we can get an English cement which will all pass a 76 by 76 and leave only 18 per cent. on a 180 by 180 sieve. This is a very fine cement, and perhaps too good for ordinary cement. All, however, should pass 50 by 50 and leave only 5 per cent. on a 120 by 120 sieve. A good cement is economical; we make a stronger mortar or concrete with much less of it, so that the extra cost is more than repaid. The particles which are retained on a 50 by 50 sieve are practically so much sand. The auther strongly urged the use of a slow-setting cement. Pats made with the minimum quantity of water should set in not less than five hours when the temperature is at 34° Fahr., and in not less than twenty minutes when the temperature is at 75°, and proportionately in time when the temperature is between these points.

SIMPLE TESTS.

Soundness or constancy of volume is one of the most important qualities a cement should have. Tests without elaborate apparatus are fortunately available. Make two cement pats on small pieces of glass, tap them out to a circular shape, about 3in. diameter, ¼in. thick in the centre, and with thin edges; keep one under water and one in air for several days. The cement should then show no cracks, change of shape, or tendency to curl off the glass, if sound. The author described other methods of testing, and strongly urged architects to test their cements by one and all of them as often as they could; it would save many after troubles. Tensile strength he regarded as the least important; it is the test on which the most varied results may be got by different observers according to the method employed in filling the briquettes. A strength of 400lb. per square inch at seven days, and 25 per cent. increase in twenty-eight days, is usually asked for and easily attained; many briquettes he had found go up to nearly 1,000lb. at seven days.

FREE LIME IN CEMENT.

It is not unusual to specify that sufficient cement should be delivered on the works at starting, kept stored in a dry weather-proof shed to a depth of not more than 2ft., and turned over daily for a fortnight before use. It is found that makers send out the cement hot from the mills, and (unless it is very high-class cement) it is much improved by air slaking. Aëration seems to improve an inferior cement by the slaking of the free lime, which if it took place in the work would be dangerous. A thoroughly sound cement should have no free lime in it, and is not improved by air slaking; it rather suffers. Cement in which there is no free lime can be produced by the maker, but it requires much care in the making, and is consequently expensive. As regards the

AGGREGATE,

the strongest concrete is made with gravel; the size should vary from large sand to small stones, passing a ¼in. or ½in. mesh, for floors or walls, to 1½in. or even more for foundations. The cleanness of the aggregate and the water is most important, as is also the cleanness and sharpness of the sand. Small sand, such as would run in an hour-glass, is utterly useless—the sand must be fairly large and sharp; it should vary in size: the more uneven the sizes the smaller the voids. The finer the sand the less the strength. There should never be more than three of sand to one of cement.

MIXING THE MATERIAL.

The author described the process of mixing concrete, which should always be done under supervision. Concrete mixing machines are much used in America and on the Continent, producing very good and uniform results. These machines are rarely seen here. One has frequently seen on a building a lot of concrete mixed up, and left for an hour or so before being set in place. If too stiff more water was added. Such treatment of the material invites disaster; initial set begins very quickly, and the concrete should be put in position as soon as mixed, and without a moment's delay. When the concrete is eventually laid on the centring, or put in the moulds, it is put in in thin layers 2in. to 3in. thick, and beaten down with iron beaters very carefully all over. This is essential in order to prevent the formation of voids, and to increase the resistance of the concrete.

STRENGTH OF CONCRETE IN PLACE.

Mr. Dunn then treated in considerable detail of the strength of the material in place, describing various tests of cement made by eminent scientists, and illustrating by diagrams and mathematical calculations. For further mathematical investigation of the subject, he referred those interested to Professor Perry's "Applied Mechanics" (p. 345), and to M. Considère's experiments, the results of which were communicated to the French Académie des Sciences in a note of March 18 last—an abstract of his communication appears in the *Genie Civil* for April 30. These writers base their discussion on "Rankine's Ellipse" of Stress, which, as given in Rankine's own words, is not easy to grasp. In Alexander and Thompson's "Elementary Applied Mechanics," however, the ellipse of stress is fully explained, and a preliminary reading of part of the last-named book should enable anyone to follow Considère's or Perry's reasoning. The resistance to the swelling and bursting action to which columns in concrete alone would be subject can be produced by binding the columns with iron or steel wire. Makers of concrete columns do so bind these according as the effect to be combated is more or less clearly understood. What is done in the Hennebique column is done by other concrete specialists. In all there is first the concrete; second, vertical bars of metal, iron, or steel; third, bindings of sheet-metal or wire.

THE METHOD OF CONSTRUCTION

is very simple. A wooden box or mould is made in which the rods are set upright; one of the bindings is then put in, and about 6 in. or 12 in. of concrete well rammed down; another of the bindings is put in, and the process repeated. The special functions of the vertical rods are (*a*) to aid the concrete in resisting the compression due to the load; (*b*) to resist any tensile stress which may be set up in the concrete by unequal loading or by any want of homogeneity in the material itself, which tensile stresses cannot be safely left to the concrete to overcome. Almost all the makers of reinforced concrete constructions put their trust in the vertical rods of metal, as the special element adding strength to the concrete, if we may judge by the large proportion of metal so used, and by the rules employed to fix the safe load, which rules take no account of the binding.

INITIAL INTERNAL STRESSES.

If there were no initial stresses in the combination the load would be carried by the two materials in the inverse proportion of their rigidities—that is to say, if the concrete were ten times as easily compressed as the iron or steel, the iron or steel would be carrying ten times as much per square inch as the concrete. But the question is not so simple. Concrete setting in air shrinks, while concrete setting in water expands. Columns for buildings always set in air, and consequently the concrete shrinks. As the concrete adheres rigidly to the metal, the concrete is put in tension and the metal in compression—into a state of internal initial stress—before the load comes on. So strong is this action that the concrete may be at the limit of its tensile strength, and the metal at its elastic limit. No formula has so far been devised which takes this initial stress into proper account. The function of the bindings is to prevent lateral swelling and bursting. M. Considère's, was the first to give this its proper consideration and importance. In almost all columns, except M. Considère's, these bindings are usually about 6in. to 12in. apart, showing that the true use of the metal is not yet fully recognised. The author gave the results of some

EXPERIMENTS ON CONCRETE IN COMPRESSION,

armoured and unarmoured, referring to those carried out by Professor Gætana Lanza, and reported in the *Transactions* of the American Society of Civil Engineers" (1903, p. 487); by M. Gary, of the Ecole Polytechnique, at Charlottenburg; by the Commission des Voûtes de la Société des Ingénieurs et Architectes Autrichiens, reported on in 1901; and others by M. Considère described in his papers on "Resistance à la Compression du Béton Armé et du Béton Fretté," in *Le Genie Civil* (November and December, 1902). Reference was also made to the test of a column made by Messrs. Cubitt and Co., and tested at Messrs. Kirkaldy's Testing Works in June, 1904. As regards

FIRE-RESISTING PROPERTIES,

from all the reports on the Baltimore fire, where as intense heat was experienced as will ever occur, the armoured concrete constructions appear to have stood best. Concrete and iron or steel expand at about the same rate under changes in temperature, and the permanence of the concrete covering in fires is no doubt due to this. There is now no doubt that iron or steel buried in ordinary concrete remains uninjured by rust for generations. When an architect decides upon adopting reinforced concrete for a structure, or part of it, he will probably put the work in the hands of a concrete specialist, who makes his own calculations for the strength of the members, and arranges the details of the construction according to his own ideas. But as the responsibility must always in some measure lie with the architect, he will naturally want to check the specialist's work, particularly when the contract has been let in competition, and there is an object in the specialist endeavouring to reduce cost to a minimum.

Mr. L. G. Mouchel followed with a paper, illustrated with lantern slides, entitled

"MONOLITHIC CONSTRUCTIONS IN HENNEBIQUE FERRO-CONCRETE."

It had, he said, been his fate to be the pioneer of the new material in Great Britain. Having explained in detail the general principles of Hennebique ferro-concrete construction, Mr. Mouchel said that it was to its great simplicity, to the common-sense which had presided at its conception, that it owed its startling success. Any labourer of ordinary intelligence could be made an apt workman in the material in a few days. He himself had had to form his own gangs of men when he introduced ferro-concrete into this country, and it took him very little time to drill them in the practice of arranging the various parts of a work in which robustness was combined with simplicity. Respecting the theory of the system of construction, it was evident that the laws, formulæ, and methods of calculation used for ordinary materials could not be applied in structures composed of such heterogeneous substances as concrete and steel. It had been objected that their formulæ for ferro-concrete was empirical. It was not so, because they had not started their work on formulæ. It was only after many years' patient observation of the results obtained that they deduced the formulæ which were the bases of all their work in this absolutely novel material. Ferro-concrete was

AN ABSOLUTELY NEW MATERIAL,

which has come in its time to enrich the engineering world. It could not be treated as a combination of steel and concrete in which the properties of the component elements could be considered and treated separately. It had its own laws of detormation. Experiment demonstrated that a rectangular bar of concrete, when subjected to tension, showed an elongation at rupture, of, say, 1/10 inch; a bar of ferro-concrete, of the same external dimensions and made of the same concrete, showed at rupture an elongation of 1 inch; that is to say, ten times greater, before showing any crack or trace of disintegration, than in the first case. The elasticity of the new material was well known; it varied in notable proportions with the distribution of the steel in the mass of concrete. The so-called Hennebique's empirical methods could be relied upon with absolute confidence; for they had been the basis upon which over 12,000 different works had been constructed, and which, in almost every case, had been subjected to severe tests, the results of which had been carefully recorded.

TESTS.

As regards tests, the age of a piece of concrete is a most important element. Good concrete goes on increasing in quality year after year. It is not advisable to test to destruction samples a few weeks or a few months old. No two results will ever be alike, even on two samples of the same age, unless they are composed exactly of the same materials, mixed in identical proportions and by the same operator. The adherence of concrete to steel increases with the age of the work. Unlike construction in ordinary materials, which, if left to itself, will deteriorate, ferro-concrete construction goes on improving endlessly in quality with age. Tests must be made on the structures themselves. The Hennebique practice is always to test their structures within a very few weeks after completion with loads 50 per cent. in excess of the calculated load. When the load is removed, it is found that the floor, owing to the elastricity of ferro-concrete, regains its former level, or, at any rate, that the deflection, if any, will be quite inappreciable. It could not be otherwise, for any stress applied to any part of a well-made ferro-concrete floor affects not merely the part under the load, but also a very large area of the floor surrounding the part under observation. This is due to the absolute monolithism of the work. Besides static tests, there should be severe dynamic tests; without these the trials of a structure in which concrete and steel are combined are incomplete. The great security offered by ferro-concrete construction arises from the fact that it never collapses suddenly, but always gives, long beforehand, unmistakable warnings. The author described a test on a Hennebique beam which he had had carried out at Bermondsey. The beam was placed on two common concrete supports. Thirty tons—i. e.,

five times the calculated load—was put by degrees on the beam, when the operations had to be stopped, the pillars being crushed and having taken a slanting position, which caused the beam to twist badly. The load was then discharged. The deflection was measured at that point, and the following morning it was found that the floor had sprung back by 1in. The beam was cracked, but loading might have been continued for some time before complete destruction had not the supports given way.

THE VALUE OF MONOLITHISM.

Buildings of Hennebique construction have been subjected to very unforseen tests. At Lens, in the north of France, coal silos had been constructed of ferro-concrete 40ft. high, to contain 1,200 tons of coal. The silos were supported on fourteen pillars. One day, when they were quite full to the brim, a train of coal trolleys came into contact with one of the legs and broke it. The corner of the silo structure was thrown suddenly in cantilever; but owing to the monolithism of the whole building, no injury resulted to the silos themselves, nor to the other three pillars of the silo so affected. They merely had to reconstruct the broken pillar. A carshed of Hennebique construction at Le Mans was divided in two spans of 21ft. by a central line of ferro-concrete pillars. One of the cars coming down a gradient got out of control, ran off the metals, and dashed into the central pillar at the entrance of the shed and broke it. The span instantly became 42ft. instead of 21ft.; but notwithstanding this, the beams supported by that pillar held perfectly, and did not show the least trace of strain—another proof of the safety due to the monolithism of the ferro-concrete construction. The construction of

FERRO-CONCRETE PILES

the author described as one of the finest, most startling, and most useful applications of ferro-concrete. Their cost is little more than that of a timber pile, and they can bear safely a weight so much in excess of timber piles that a very considerable economy can be affected on the total cost of a foundation. At the present moment a foundation was being constructed in which the use of ferro-concrete piles procured a saving of over £12,000, as compared with the original estimate for timber piles. Judicious distribution of steel in ferro-concrete is at the root of success, whether it is in a beam, in a pillar, or in a floor—but, above all, in a pile.

THE ABSENCE OF VIBRATION.

Owing to the absolute monolithism of Hennebique constructions, they are far less liable to vibrations than ordinary constructions. One of the things which strike one most when entering a factory constructed entirely of ferro-concrete, where heavy machinery is at work, is the absence of vibrations and of noise. It is an everyday practice to attach shafting direct to the Hennebique pillars, which consequently have to sustain powerful lateral pulls. Heavy machinery—such as disintegrators grinding heavy materials, dynamos, and dynamo-motors—is also fixed direct on the Hennebique floors; and, after years of that treatment, the quality of the concrete has been found not to have suffered in the least.

FREEDOM FROM RUST.

Indisputable proofs have been given that the very best material to protect steel is concrete itself. Oxide of iron cannot exist in contact with concrete; rusted iron bars imbedded in concrete will, in the course of a month or so, be as bright as new. Concrete used in ferro-concrete is markedly different from ordinary concrete, both in its composition, in its make, and in the way it is employed. It is composed of materials of small volume (¾in. maximum for the gravel or stone), and the materials used are very clean. The proportions of sand and stone are always adjusted so as to give a concrete quite full—it is used in small quantities at a time, and so vigorously rammed that no cavities or porosity are possible. As regards the

ADHERENCE OF CONCRETE TO STEEL,

its value is such that it justifies the practice of some ferro-concrete builders who only reckon on concrete to make the junction between the different metallic parts of a structure. Experiments have demonstrated its surprising resistance to high temperature and sudden cooling. After the most destructive fires, Hennebique constructions have been found as strong as ever. As regards

ORNAMENTATION,

there is no reason why ferro-concrete buildings should not be made as artistic as constructions in ordinary materials. There is none that lends itself better—and more economically, too—than ferro-concrete to any shape that one may wish to give to it. To show the ease with which the material lends itself to ornamentation, a photograph was exhibited of the main reception-room in the extension recently carried out at the French Embassy in London. Except the external walls, the whole of the building is in ferro-concrete.

PROHIBITIVE LONDON BUILDING REGULATIONS.

In his concluding observations, the author referred to the mischief of the building by-laws in force in London. London enjoyed the unique privilege of being the only city in the civilized world where ferro-concrete constructions are actually prohibited. Building regulations of nearly every other city in the United Kingdom did not, read strictly, permit of the use of ferro-concrete; but, after intelligent and impartial investigation by the various authorities, Hennebique construction had been allowed. Such buildings have been erected in London, but only on ground belonging to railway and dock companies. These facts have been brought to the attention of the London County Council when they had been applied to for permission to erect similar buildings on ground within their jurisdiction; but in vain. They always met with the same reply:—"The Act Stipulates a certain thickness for walls. If you give your walls that thickness you can build." But to give ferro-concrete walls that thickness would be financially an impossibility and, practically speaking, an absurdity, since the comparatively thin walls of ferro-concrete are many times stronger and safer than those stipulated in the Act. He trusted that when the new London Building Act was framed, ferro-concrete construction would no longer be excluded. Ferro-concrete construction is absolutely safe; it cannot lend itself to the malpractices of the jerry-builder. Trickery is impossible with it. Should the contractor try to cheat, try to escape the specification, detection will not occur months or years after, but at once.

On account of the lateness of the hour at which the second paper concluded, 10.20 p.m., the Chairman suggested that any discussion should be postponed till the next meeting of the Institute, on Monday, Dec. 5.

ONTARIO HAS MARBLE.

Marble quarries of good quality are numerous in Ontario, although only two of them are being worked, says Inspector Carter, of the Bureau of Mines. One of the two in operation is near Renfrew, and the other at Halley Station, a short distance east. There are a number of unworked quarries in the counties of Hastings and Frontenac, and also in Algoma. The reason that there is so little marble quarried in Ontario is that Tennessee marble has gained the market, but that there is no reason why this state of affairs should continue, is shown by the interior of the Ottawa Parliament Buildings which is all Renfrew stone.

CARDINAL GIBBONS ON THE RIGHTS OF LABOR.

His opinion is as follows:—"The right of a non-union laborer to make his own contract freely, and perform it without hindrance, is so essential to civil liberty that it must be defended by the whole power of this Government."

MR. JOSEPH CONNOLLY.

Mr. Connolly's death, on Dec. 13, closes what was, until the last two or three years, a very active architectural career in Ontario. Mr. Connolly was in his 65th year. He was born in Limerick, but passed most of his life in this country. He was a member of the Irish Royal Institute of Architects, and was one of the most accomplished of Canadian architects. He was trained in the office of Mr. McCarthy, of Dublin, who held a similar position among Irish architects to that occupied by Sir Gilbert Scott in England. After serving for a time as Mr. McCarthy's chief assistant, and subsequently making a tour upon the continent for the sake of study, Mr. Connolly began practice in Limerick. He did not, however, remain long there, but came to Canada, and soon acquired the special practice for the Roman Catholic church which was his life's work, and which enabled him to continue always (excepting upon one or two occasions) to design in the style in which he was trained and in which he worked with freedom and originality. Besides a great deal in the way of alterations, additions and improvements to Roman Catholic churches and institutions, including the additions to St. Michael's Cathedral, in Toronto, and its decorations, the following buildings were his work:—

In Toronto: The Chapel of St. Joseph's Convent.
The south wing and Chapel of the House of Providence.
St. Paul's Church (Italian Romanesque.)
The Sunnyside Orphanage.
Some Roman Catholic Schools.
St. Mary's Church (his last work.)

In Kingston: The new front and tower of the Cathedral and several churches.

In Hamilton: The remodeling of St. Mary's Cathedral.
St. Patrick's Church.
The James Street Baptist Church.

In London: St. Peter's Cathedral and many Roman Catholic churches in the diocese.

The Franciscan Church in Chatham.

The Jesuit Church in Guelph.

Churches in Prescott, Kemptville, Tweed, Kincora, Formosa, Sault Ste Marie, Caledon, Arthur and many others, including St. Michael's church in Belleville, the destruction of which the other day was the cause of so many lamentations in Belleville.

An American Forest Congress will be held at Washington on Jan. 2-6, 1905, under the auspices of the American Forestry Association. Its purpose will be to establish a broader understanding of the forest in its relation to the great industries depending on it; to advance the conservative use of forest resources for both the present and the future need of these industries; and to stimulate and unite all efforts to perpetuate the forest as a permanent resource of the nation. This purpose is one which deserves the hearty support of engineers and architects, for the increasing cost of timber indicates that the time is soon at hand when forestry will become one of the most imperatively needed callings in the country. Anything that can be done to spread an appreciation of its importance deserves hearty support. The secretary of the Congress is Mr. W. L. Hall, Atlantic Building, Washington.

MOVING AND ERECTING LARGE GRANITE COLUMNS.

Around the altar of the Cathedral of St. John the Divine in New York, there is to be a semicircular row of eight granite columns 6 ft. in diameter and 54 ft. in height. Each column is made in two pieces, the lower one being 36 ft. long and weighing 90 tons. The upper one is seated without doweling on its flat top, has a length of 18 ft. and weighs 40 tons. The columns were quarried and cut at the Bodwell Granite Co.'s Fox Island quarries at Vinalhaven, Me. At first it was intended to make them monolithic and no special difficulty was experienced in quarrying full-length slabs from a stratum of about the required thickness. These were hand-dressed approximately cylindrical and the first one was successfully turned in the lathe but broke while being polished. The break was attributed to torsion and for the second column power was applied at both ends of the lathe. Notwithstanding this arrangement, the column broke during the roughing. It was then suggested that the trouble lay with the excessive bending stresses due to the very long unsupported length and a center support was provided for the third column. This column broke more quickly than either of its predecessors and the attempt to make them monolithic was then abandoned.

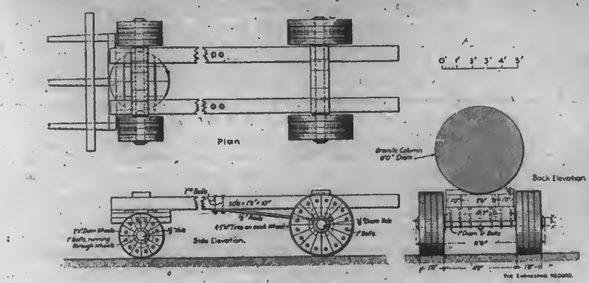
The shorter pieces were turned and polished without difficulty and were then enclosed in cylindrical cases made with 3 x 4 in. steel-hooped wooden staves set close together and secured to circular end pieces. They were loaded on barges, two complete columns to each, and were towed to New York. Skids were arranged from the deck to the shore and several turns of wire cable were taken around the middle of the column. One end was made fast to a hoisting engine and the free end was kept tight as the rope was overhauled and rolled the column easily to shore. Each piece was loaded on a special wagon and transported over a mile through the city streets and up a considerable grade to the site.

The wagon was built in Maine expressly for use on this work and is of simple and massive construction. It consists essentially of two pairs of wheels, two longitudinal beams and two cradles on the axles, and is built entirely of wood except the axles, tires and a few bolts and small braces. The 10 x 12-in. longitudinal timbers are 30 ft. long, are 3½ ft. apart on centers and overhang the front and rear axles about 2 ft. and 5 ft., respectively. The 8 x 8-in. rear axle and the 7 x 7-in. front axle each has six U-bolts fastening a solid 10 x 14-in wooden bolster to the upper side. On the front axle the bolster supports a horizontal wooden turntable platform or fifth wheel, on which the longitudinal timbers are seated. At the rear end they are seated directly on the bolster. Solid fillers are put on the axles between and above the longitudinals and are concaved on the upper surface to a radius of 3 ft. to receive the columns which are thus supported about 4 ft. clear of the pavement.

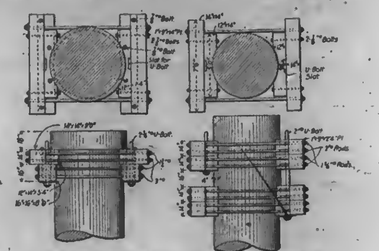
The rear wheels are about 4 ft. and the front wheels about 3 ft. in diameter, all of them being 20 in. thick and made with seven thicknesses of planed white oak plank. Each thickness is made of sixteen sectors in the large wheel and twelve sectors in the small wheel, bolted together and breaking joints in adjacent thicknesses. A steel disc is bolted to the center of the wheel on each side and through it and the solid planks a hole was bored to fit the axle, so that the bearing of the latter was on the ends of the fibers. The tires consist of four 5 x 1-in. welded rings sunk on each wheel. The rear wheels are provided with a break shoe operated by a screw, but it was seldom necessary use this, most purposes being served by a transverse timber chained to the axle and dragging on the ground close to the wheels, but clear of them so long as the wagon advances. If the wagon tends to move backwards, the timber immediately serves to chock the wheels.

The wagon was hauled by a six-part manilla rope tackle which had a clevis attachment to a sheave set in

the bight of a steel cable, one end of which was attached to the center of each axle, thus distributing the traction stress equally on both axles. The forward block in the tackle was attached to a 1½-in. wire rope anchored in front and the fall line was operated by the drum of a Lidgerwood hoisting engine. The hoisting engine was chained to a pair of bent hooks with their points turned vertically downwards in holes about 6 ft. apart which were made by the removal of single Belgian blocks from the pavements. The shanks of the hooks lay horizontal on the surface of the undisturbed pavement underneath a heavy transverse beam on which a traction engine was seated and furnished steam to operate the hoisting engine. This provided a very strong and simple anchorage which was shifted with ease and rapidity and involved no excavating or counterweights. The 1½-in. wire cable was made with several 50-ft. lengths each corresponding to the extended length of the tackle. When the tackle was pulled up so that the blocks nearly jammed, it was disengaged from the cable and a whip line attached to the forward block was reeved through a sheave hooked into the next joint of the cable and the free end was brought back to the capstan of the hoisting engine and wound up there so as to rapidly overhaul the tackle. The last length of the cable was disengaged, the tackle hooked on in its place and the cycle of operations repeated and so on, thus moving the column with very little loss of time. When the wagon was hauled up



Timber Truck for Columns.



Friction Clamps for Top of Column Sections.

close to the hoisting engine, the latter was pulled forward the full length of the cable by means of the traction engine and these operations were repeated until the columns arrived at the site.

The system worked satisfactorily and the wagon did not cause any injury to the pavement. The progress was absolutely steady and smooth on an up grade, but on a level or down grade it was noticed that the irregularities of the pavement caused slight deflections in he progress of the wagon, due to the twisting of the forward axle. The first column-section was drawn from the pier to the site in nineteen days. Some of the others were drawn in seven days each. The eight columns were transported in about six months with a force of four men and a superintendent.

At the site the column sections were revolved into vertical positions and hoisted by three tackles forming a thirty-part system suspended from a shear legs or breast derrick made with two Oregon pine timbers 98 ft. long hewed 2 ft. square for the lower 50 ft. and tapered thence to a diameter of 20 in. at the top, where they are capped with an oak timber. From this timber were suspended a pair of ten-part tackles and a single six-part tackle in the center, all of them reeved with ¾-in. steel rope. The center tackle was an independent one operated by a separate hoisting engine. The two side tackles were reeved with a single line common to both so as to equalize the stress between them and carry through single top and bottom sheaves so as to make up the thirty parts and lead each end to a separate Lidgerwood hoisting engine. By this arrangement equilibrium was maintained between all parts of the tackles and the stresses were equalized no matter whether the engines were working uniformly or simultaneously or not. It was considered that the eccentric stress in revolving the column from the horizontal to the vertical position would be dangerous for lewis bolts, and a special device was adopted for attaching the tackles to the upper ends of the columns during this part of the operation.

The 90-ton bottom sections of the columns were turned and polished up to a distance of 18 in. from the end, where a rough shoulder of a diameter of about 10 in. greater than the shaft was left to form a collar. On the under side of this collar a pair of concaved yoke pieces were bolted to and took bearing against it. Through each side was set a 2¾ in. U-bolt to which a sling was attached to receive the tackles. The lower end of the column was lifted and placed on rollers, tackles were attached to the upper end and operated to drag the column forward and lift it into a vertical position, when it was seated on the permanent base. The yokes were then removed and the enlarged upper end of the column was scabbed off by hand and the surface was dressed perfectly horizontal to a line marked by a diamond on the polished surface of the shaft.

The 40-ton upper sections of the columns were handled by a different method. No collar was left on the end of the shaft which was dressed to the exact dimensions. Two clamps made with pairs of solid oak yokes connected by two 1¾ in. and two 2-in. screw rods at each end were fitted to the top of the column about 16 in. apart and screwed up as tight as possible so as to develop a large amount of friction. A U-bolt of 2-in. iron was attached to one side of the upper yoke and a similar one was attached to the other side of the lower yoke, passing freely through a slot in the upper yoke. The hoisting sling was connected to these U-bolts and thus developed balanced eccentric stresses in both yokes, tending to cramp each one against the column and increase the friction, but maintaining equilibrium between themselves. This connection sufficed to revolve the column into a vertical position and it was temporily seated on the lower end, the yokes removed and a lewis bolt inserted in the top. The tackles were connected to the lewis bolt and lifted the column and seated it on the top of the lower section in its permanent position.

It required about one month to set up both sections of the column and prepare for the setting of the next column, but when everything was in readiness, the actual hoisting of the column occupied a very few minutes. Five of the columns have been erected and it is expected that two more will be erected this fall and the remaining one next spring. The total cost of the eight columns is about $155,000. Two years were required to quarry and cut them and about two years more will have been required to transport and set them. Messrs. Heins & La Farge are the architects of the cathedral and the columns have been made, transported and erected by Mr. John Peirce, contractor; Mr. Emil Diebitsch, chief engineer.

SANITARY REPORT ISSUED.

Dr. Louis Laberge, health officer for the City of Montreal, has just issued his thirty-first report, which contains some very interesting statitistics on the sanitary condition of Montreal city.

LEGAL.

A legal decision of both interest and importance to all concerned in the building trade and its allied professions was given last week by Mr. Justice Ridley, sitting without a jury. The question was apparently a simple one: If an architect and surveyor makes plans, drawings, specifications for an employer and is paid therefor, has the architect (in the absence of any special condition) the property in these documents? To that question some business men of experience would give a confident affirmative answer, while others would reply with a very emphatic negative. To state briefly the facts of this case (Gibbon *v* Pease), the plaintiff owned some property at Bayswater which he wished to convert into flats, and for that purpose he employed the defendant as his architect and surveyor, and an agreement was entered into by a firm of contractors, that they should execute the necessary work under the directions of the defendant. The local water company would not pass defendant's plans, whereupon Gibbon, the plaintiff, instructed a firm of plumbers to smooth over the difficulty, and to do that part of the work to the satisfaction of the water company. The defendant, not having any notice of this arrangement, expressed his annoyance that a professional slight had been put upon him. However, the work proceeded and was in due time finished, and upon its completion plaintiff asked his architect for his charges and paid them without demur. Gibbons thereafter asked Pease for the plans and other documents referring to the property, but Pease absolutely declined to hand them over, alleging that, beyond a *lien* for his charges, he had the absolute property in the documents according to a universal and well-known custom in the trade. Hence the action to compel defendant to hand them over. In the schedule of the Royal Institute of British Architects, paragraph 16 reads: "In respect of the ownership of drawings and specifications, it has hitherto been the general custom for the architect to be paid for their use only, *those documents remaining his property* . . . No authoritative decision in the courts of law has yet been given on the subject; it is therefore desirable, that for the present at least, that the architect should have a distinct understanding with his employer on this point."

Against this two strong opinions may be pitted. First, in his "Book on Buildings," Lord Grimthorpe sets out in full the standing form of agreement with an architect in use by the Commissioners of Works. There paragraph 6 runs: "The plans and the documents relating to the work shall be the property of the Commissioners—*i.e.*, at once; not merely after the work is done—and the architect shall make at his own expense all copies of them necessary for the conduct of the work." Secondly, paragraph 17 of the same is as follows: "No rules of the Royal Institute of British Architects or any other society to be held binding on the Commissioners."

It should be added that the decisions on the point under discussion are so uncertain and conflicting, that Mr. Justice Ridley felt himself compelled to take his own, and he entered judgment for the plaintiff, with stay of execution for three weeks pending an appeal. The matter will certainly go to the Court of Appeal, and we shall at last have a definite settlement of what has been for a long time a too-much-vexed question.—The (London) Contract Journal.

HOPEWELL v. KENNEDY.—Judgment by Chief Justice Meredith, in the Divisional Court, Toronto, on appeal by defendant from an order of the Judge of the County of Carleton, sitting at Ottawa Spring Assizes, for the Assize Judge. The action is for libel and being called for trial and before the empanelling of a jury, plaintiff's counsel moved for order to strike out certain paragraphs of defence and defendant's counterclaim. The order was made with leave to defendant to amend. The plaintiff, an Alderman of the city of Ottawa, and a member of the Building Committee of the Public Library, for the stonework and masonry of which defendant was contractor, made certain criticisms in committee in respect of work done by defendant upon the building. The libel complained of was embodied in a letter by defendant published in The Ottawa Evening Journal, 23rd October, 1903, in answer to plaintiff's criticisms. The point involved in the appeal is whether the defendant's statements were privileged. Held, that the plaintiff made no appeal to the public in offering his criticisms at a committee meeting, and that it was not open to defendant to enlarge the constituency created by the plaintiff and claim a privileged occasion. Some of the paragraphs are deemed admissible in mitigation of damages, and limited to that purpose, may be so pleaded. As to the counter-claim, held, that the reference therein to the charges as set forth in the statement of defence, and the further allegations that such charges were falsely and maliciously spoken by plaintiff, are quite sufficient to make the counter-claim in its present form a good pleading within rule 268. Appeal allowed as regards counterclaim and dismissed as regards statement of defence. Defendant may amend within five days. No costs of appeal on order appealed from. H. M. Mowat, K.C., for defendant. No one for plaintiff.

The new Union station at Toronto will cost $3,000,000 The architects who have been asked to prepare plans are Messrs. Darling & Pearson, Mr. E. J. Lennox, and Mr. A. H. Chapman.

Definite announcement is made of a new union depot for Emerson, Manitoba. Four of the five railroads entering the town vis., the Canadian Pacific, Great Northern, Canadian Northern, and Minneapolis, St. Paul & S. S. Marie Railway, will construct a new international union depot on the border where the four lines intersect. Owing to the fact that two of the companies interested are American and two Canadian a like portion of the depot will be placed on each side of the international line.

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NOTES.

We regret to record the death of Mr. John Hillock, a well known figure among the builders of Toronto. Mr. Hillock, when making a Thanksgiving Day visit to his daughter, the wife of Dr. Addison, of Penetanguishene, caught a cold from which pneumonia developed. He was born in Toronto in 1834 and had lived there all his life. He is survived by four daughters, three of whom reside in Toronto.

Mr. John Moser, a well-known American architect, died at the age of seventy-two, at Atlanta. In early life he practised in Ohio and in Canada, but in his later years he settled in Alabama and Georgia, after having filled the place of a designer in the office of the Supervising Architect, under Mr. M. E. Bell. Amongst the buildings designed by Mr. Moser may be named the Cotton Exchange at Galveston, Tex., and St. Philip's Episcopal Cathedral in Atlanta, Ga., the latter being carried out in association with Mr. E. G. Lind.

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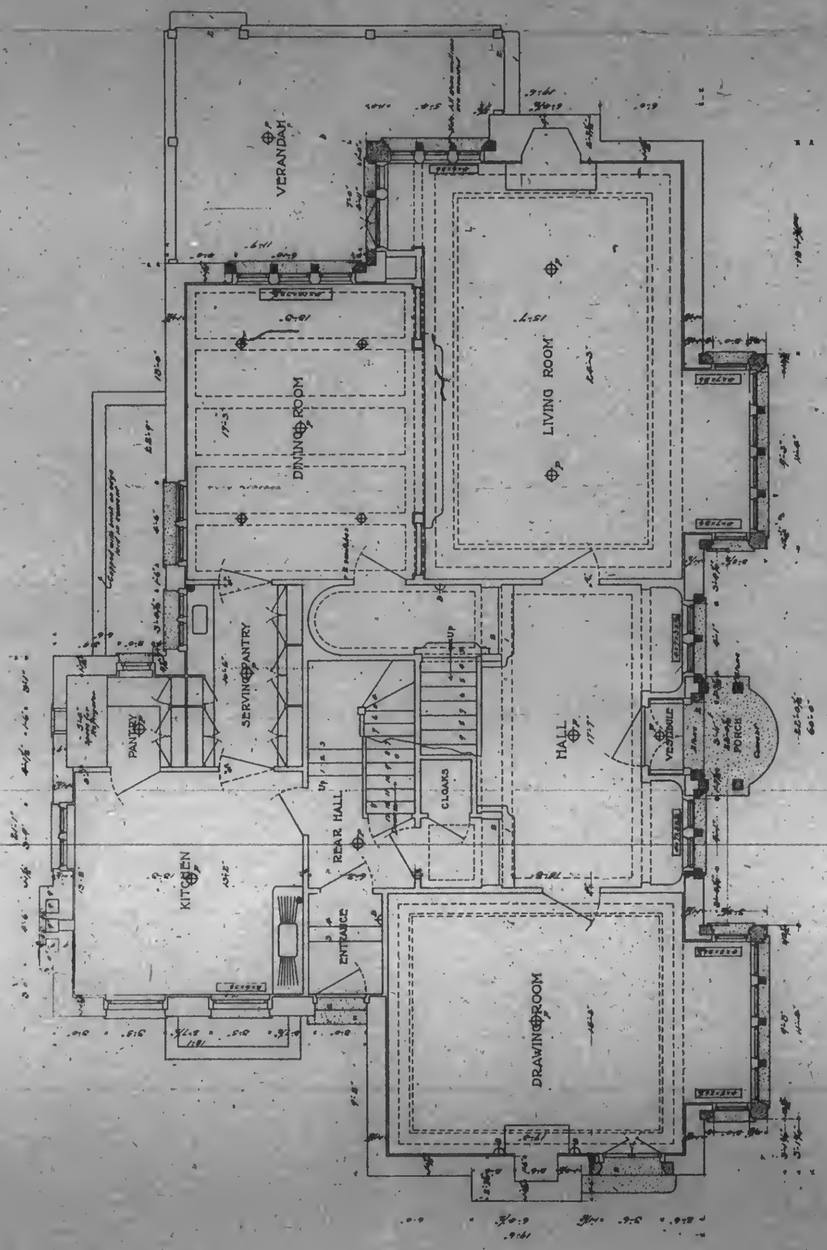

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GROUND FLOOR PLAN.

SUPPLEMENT TO
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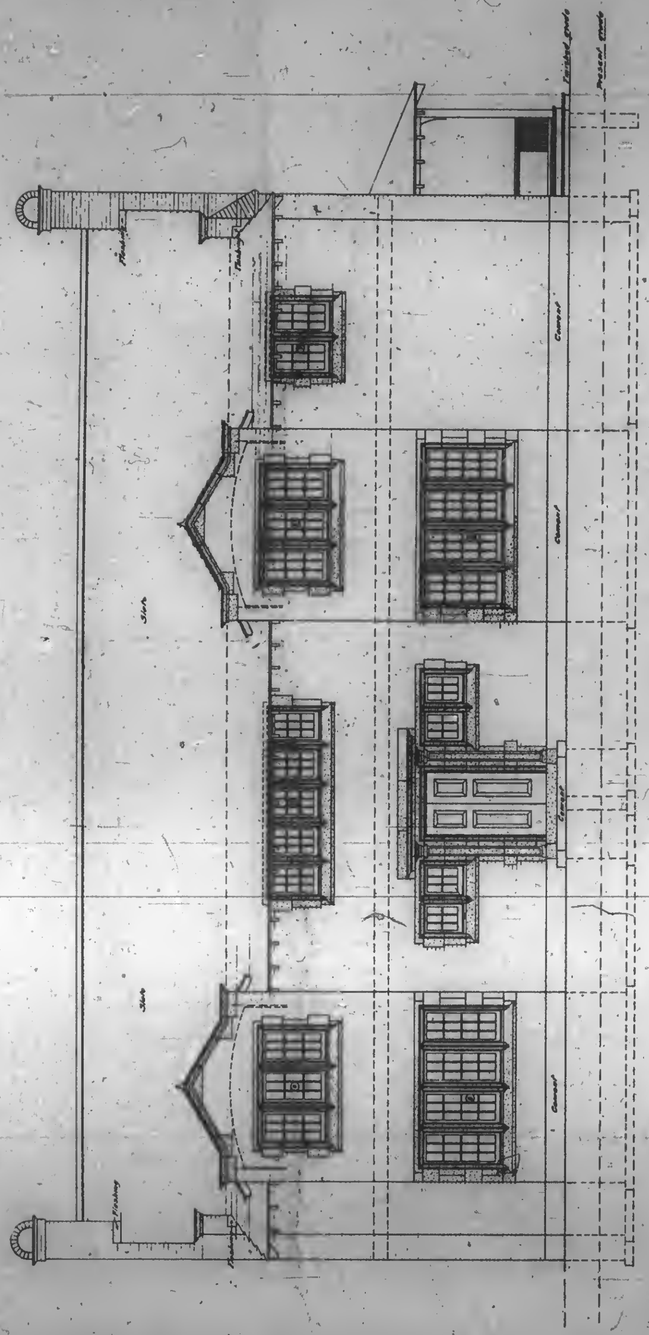
DECEMBER, 1904



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SOUTH ELEVATION.

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SANTA CROCE, FLORENCE.
LOOKING EAST.

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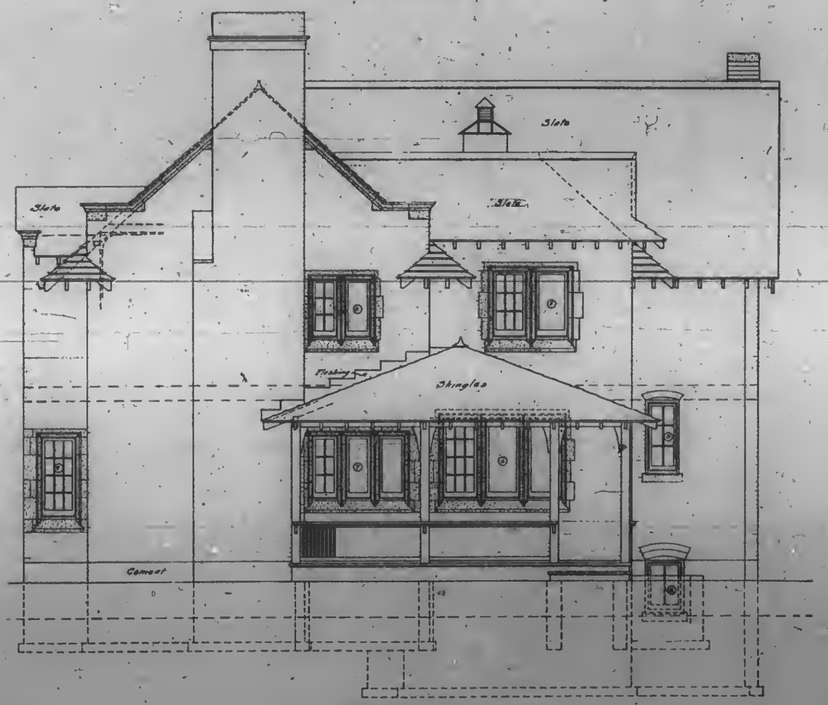

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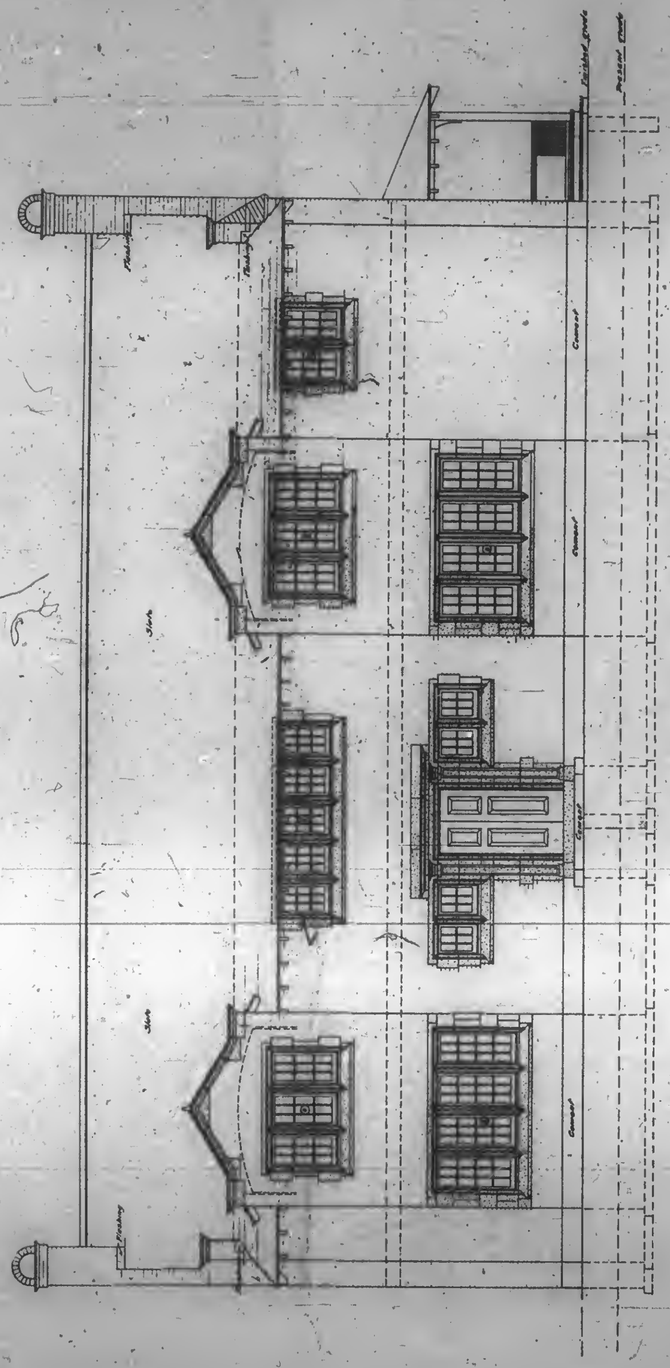

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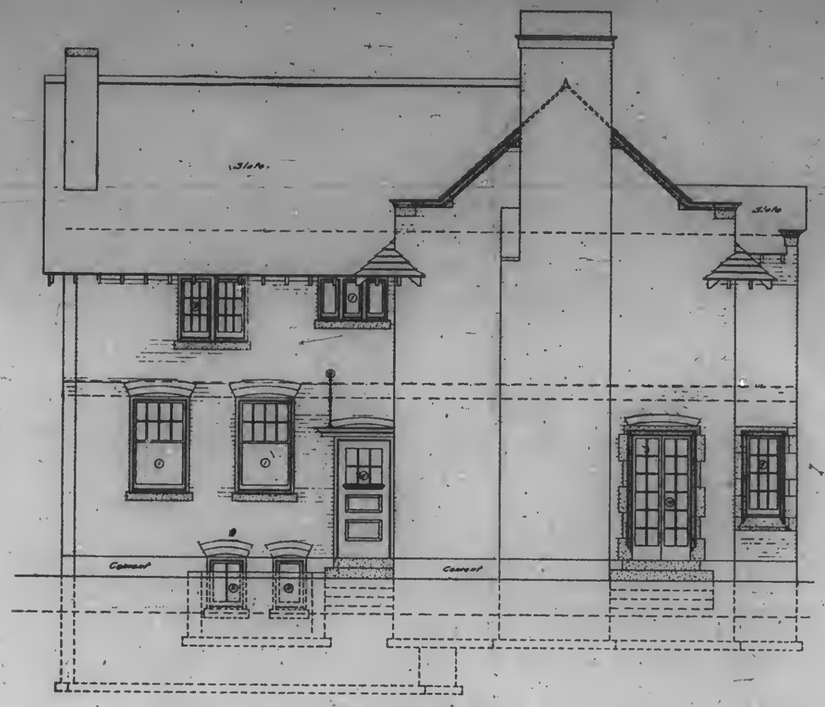

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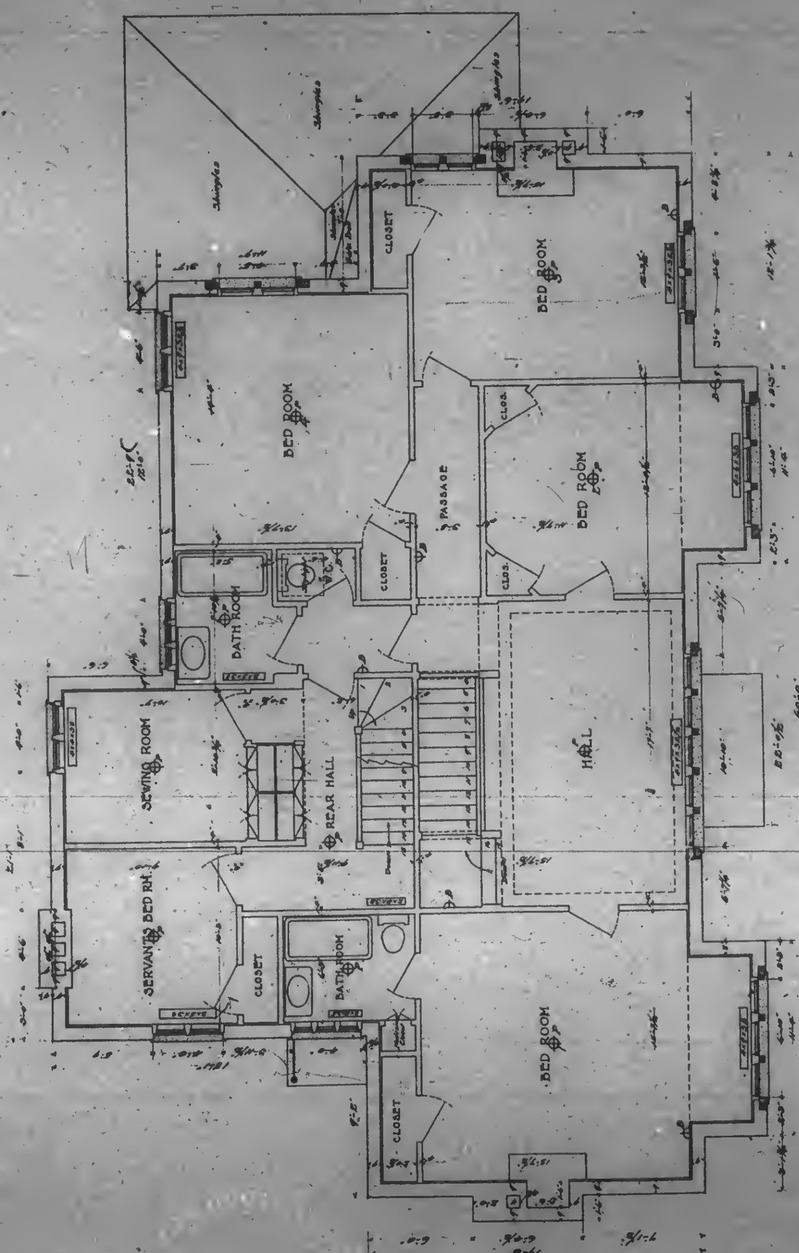

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